Safety Maintenance

Affiliated with "SAFETY ENGINEERING"

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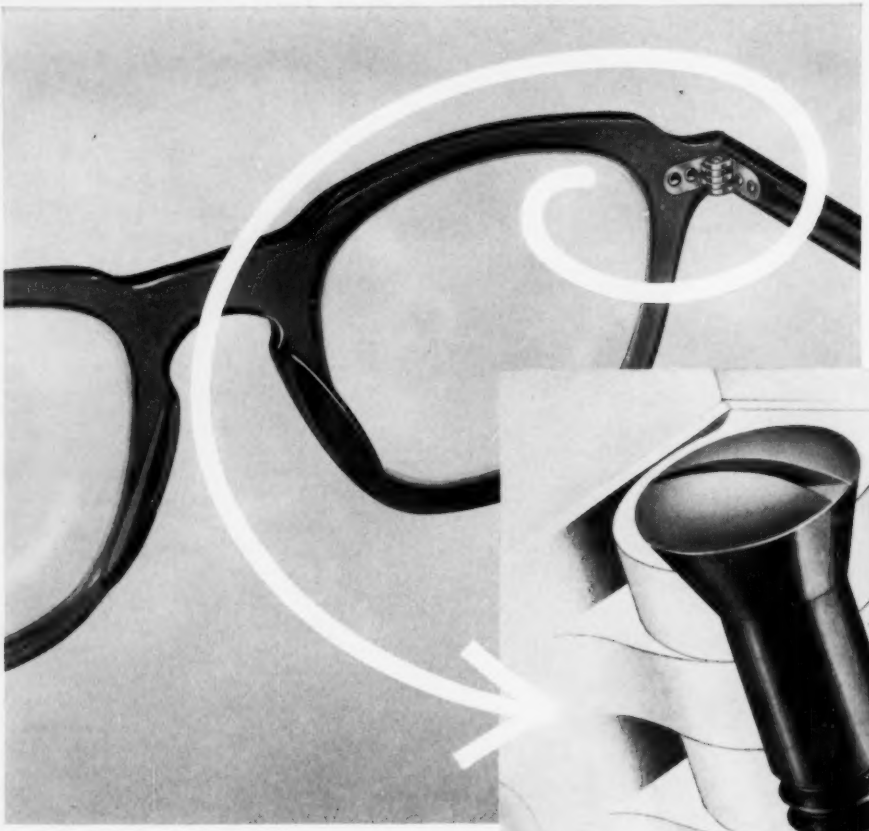

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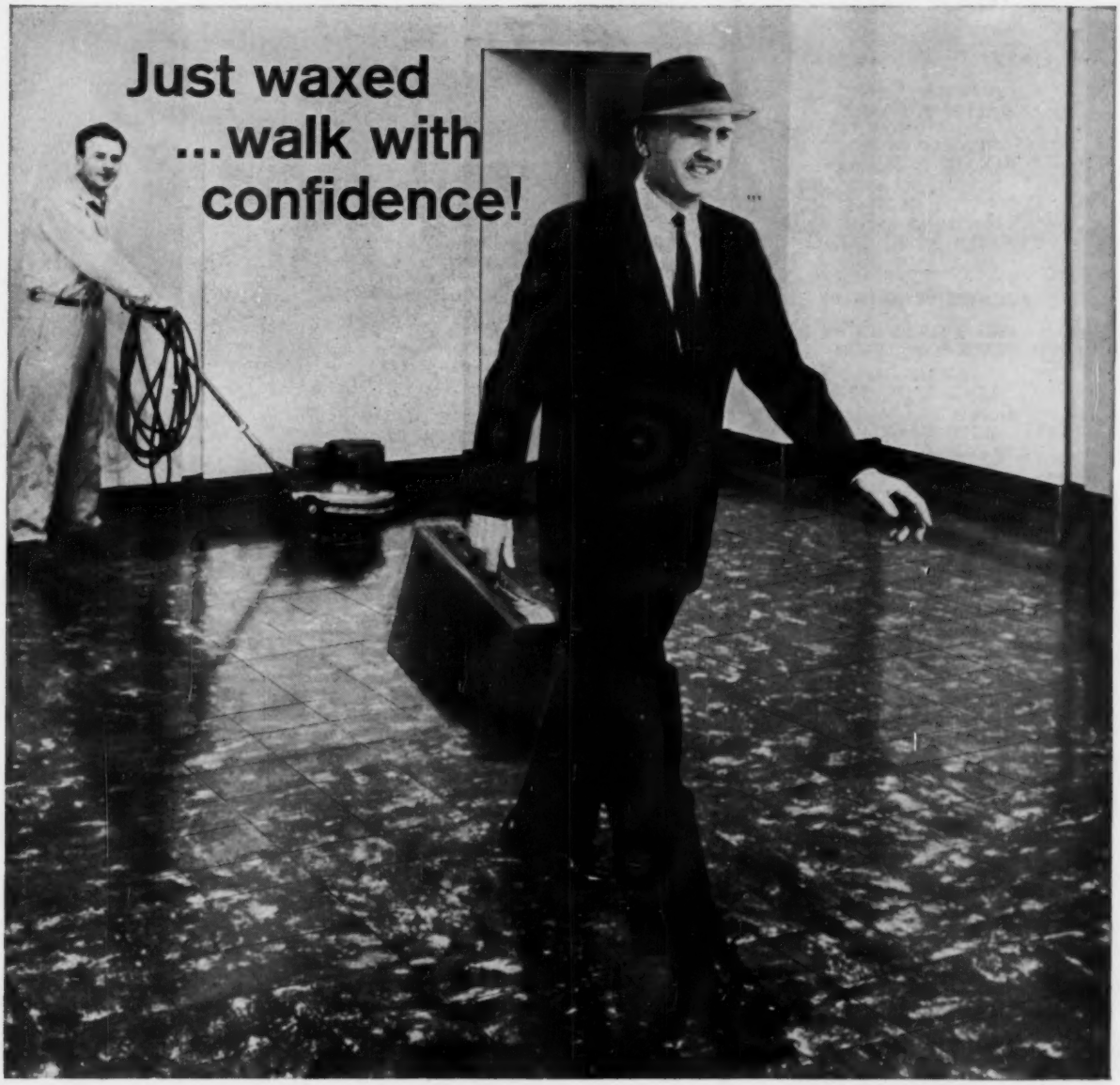
(For details, use Key # G-1 on card on page 33)



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Volume 122, Number 1 **July, 1961**

EDITORIAL

Blame vs. Responsibility 3
That Aching Back 3
Britain's Mr. Safety 3

ACCIDENT PREVENTION

How to Investigate Accidents BEFORE They Happen 5
by JOHN L. PICKENS
Preparing for the Unknown 9
Is Your Materials Handling Hurting? 12
(materials handling series) by RUDY PELLMAR
Message With a Lift! 16
Survival Car II Packages the Passenger for Safety 18
Keeping Up With Sign and Signal Developments 50
(sign and signal series)
New Accident Prevention Bulletins 33
New Accident Prevention Products 62

MAINTENANCE

Plastic Paint Look Promising 15
Epoxy Licks Leaks 17
New Maintenance Bulletins 33
New Maintenance Products 62

INDUSTRIAL HYGIENE

Industrial Hygiene News 27
Triple Check Air Test 29
Why Noise Control? 30
(noise control series) by WILLIAM F. GLASER
New Industrial Hygiene Bulletins 33
New Industrial Hygiene Products 62

FIRE PROTECTION

The Fire Front 41
Air-Raid on Forest Fires 42
New Answers to New Chemical Fires 45
by EDWARD L. HARRIS
Sprinklers Guard Vital Production 47
New Fire Protection Bulletins 33
New Fire Protection Products 62

SPECIAL DEPARTMENTS

A Salute to a Safety Idea 23
Another Injury Checked 24
The Future Shows 25
The Safety Shelf 26
Loss Stoppers 33
Reader's Free Inquiry Card 33
What's Your Problem? 34
What's the Law? 39
Achievements & Awards 49
Safety on Film 59
Inside the Trade 60
What's New 62
Semi-Annual Index 67
Index to Advertisers 68

Cover picture by courtesy of C. H. Leavell & Co. (Rushmore Photo): Giant steel springs to form an inner spring mattress are installed on the floor of a Titan missile silo.

SINCE 1901, AMERICA'S PIONEER INDUSTRIAL SAFETY MAGAZINE

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it's SAFE to say

● BLAME vs RESPONSIBILITY

Ever since the safety movement was in its swaddling clothes, it has been a truism that the supervisor or line foreman is the key man to the prevention of accidental injury. So what? In far too many plants, both large and small, the supervisor, whatever his actual title, is by-passed until long after an accident happens. The medical department records and treats the victim's injuries, the safety department gets busy, the safety committee does its job of inspection and then the supervisor may find a ton of blame dropped upon his shoulders instead of full responsibility for preventing the accident *before* it happens.

An accident, according to John L. Pickens, writing elsewhere in this issue, is "a clue to something going wrong." It not only is a "dramatic incident showing that all is not going well," but actually an accident is evidence of some form of bad management. Proper accident investigation, Mr. Pickens emphasizes, points the way to conditions causing many other losses in the organization.

It is high time that all branches of the executive department upgrade the supervisor in the field of preventing accidents which may or may not result in immediate injury. We can keep telling ourselves that the supervisor is the key man to safety but this lip service is utterly meaningless unless we make it clear that he shares responsibility for accident prevention in his department . . . and here is where responsibility must be accompanied by authority!

This understanding and acceptance of safety responsibility is a many-faceted thing. The supervisor must know that any accident affects time schedules, product quality and costs. Therefore, he must investigate every *incident* which can lead to an accident; participate actively in employee training and finally, understand that his authoritative approach to safety will mean smoother operations, reduced costs, fewer crises, better liaison with the head of the safety department and certainly higher status and prestige for himself.

If the supervisor is the key to accident prevention, the only way to use that key to open the door to safety is to give better than adequate motivation to that supervisor. Convince him of his responsibility and train him to recognize that accident control is a vital part of his total job. Once the supervisor reaches the conclusion that he is merely an after-thought in accident prevention, the "key" opens no more doors.

● THAT ACHING BACK

If we hear, "Oh, my aching back," it is not necessarily a quotation of the President of the United States. Nor is it very funny!

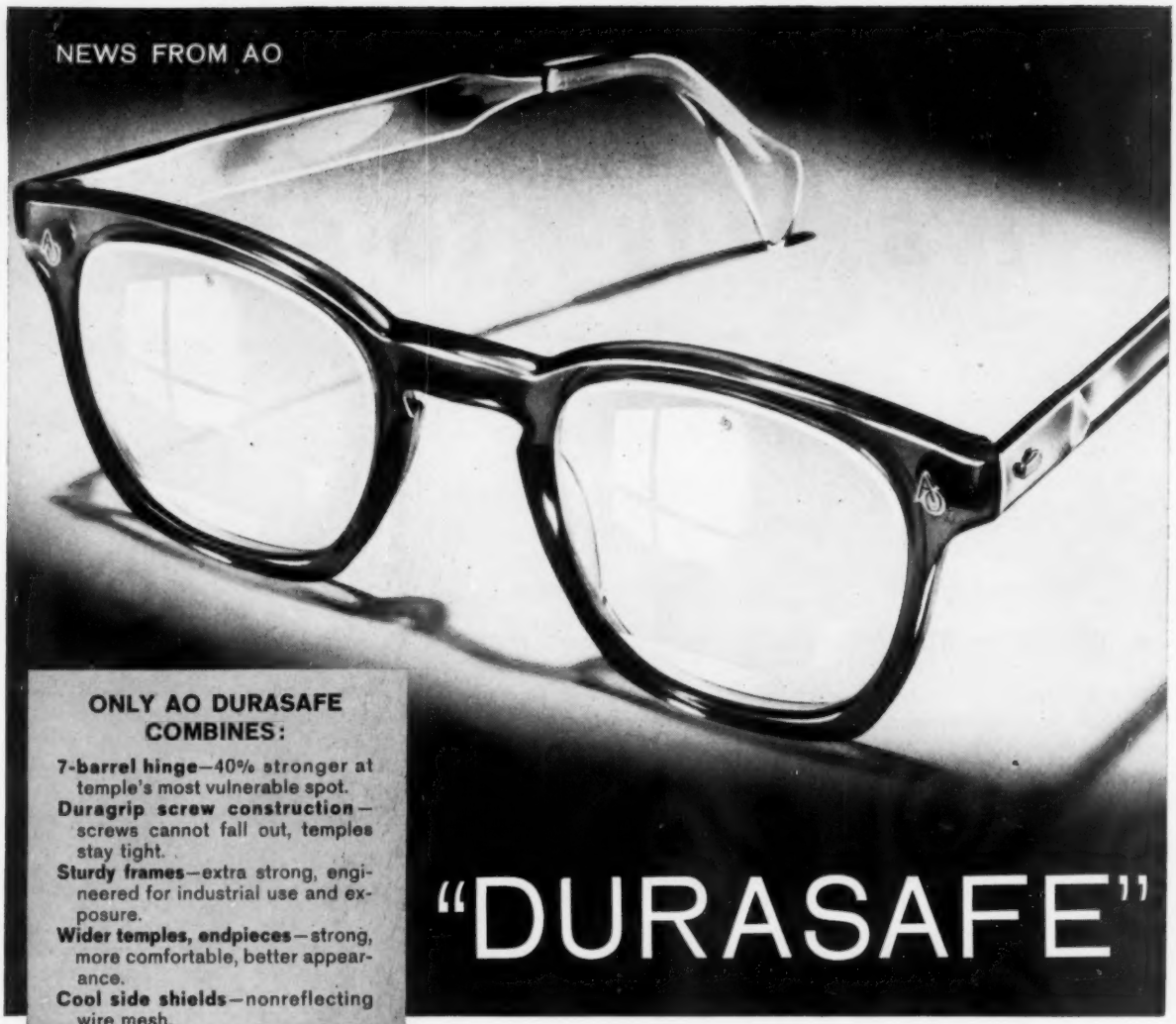
It means that, in too many industrial plants, something is wrong with your materials handling (see pages 12 and 16 of this issue), and that every aching back in industry can shoot direct and hidden costs sky high.

● BRITAIN'S MR. SAFETY

It always is a pleasure to welcome safety leaders from other countries of the Western World . . . we cannot be quite certain that there are many safety leaders in other countries where manpower is their most expendable resource.

Recently, we were privileged to receive in our offices, Mr. Leonard D. Hodge, National Director of the British Safety Council which, in just four years, has built up an impressive industrial membership of 6,500 member factories, representing nearly four million British workers. This superb accomplishment on the part of Mr. Hodge and his equally dedicated associates refutes any theory that Britons are too conservative. On the contrary, safetywise and in many other fields as well, our British cousins are quick to grasp a good thing when they see it . . . and hold onto it with the tenacity with which their name is synonymous.

NEWS FROM AO



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...the glasses workers wear willingly

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*Other types of AO safety goggles are needed to cover special hazards.

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(For details, use Key # G-3 on card on page 33)

How to Investigate Accidents BEFORE They Happen

The supervisor is the key to accident prevention. BUT, is safety an adequate motivation for the supervisor . . . to make accident investigation pay off?

by **JOHN L. PICKENS**
Superintendent
Home Engineering Office
Hartford Accident & Indemnity Co.
Hartford, Conn.

The time has come for us to stop kidding ourselves about the significance of an accident. *An accident is the clue to something going wrong*, a dramatic incident which may well be the *first* evidence that all is not well. If we accept this premise, here is one of the best starting points for reaching "pay dirt." Proper accident investigation can point the way, not merely to a condition which caused an accident, but to conditions which are *causing many other losses* in the organization. These losses may have been piling up for a long time regardless of whether *any* accident occurred or may occur in the future.

And now, another point about which some of us have been kidding ourselves. Many progressive organizations recognize that the control of accidents is an operating problem. Many of them issue formal policy statements, indicating their belief that the job can be accomplished only through the line organization, meaning the *supervisors*. But let's see what happens in some of these same companies when an accident occurrs:

- **The Medical Department treats the injured and prepares records.**
- **The safety engineer appears on the scene to investigate the accident and prepare a report.**
- **Various individuals begin to grind out records and statistics.**
- **Sometimes a review of these statistics is the first notice to the supervisor that anyone in his department was injured.**
- **A meeting is called to discuss safe practices, usually by the Safety Department.**
- **Someone shows a film, discusses the record and gives a pep talk.**
- **Personnel, Training or Safety Departments prepare a notice which appears on the bulletin board.**
- **The safety or inspection committee inspects the department.**

Have I gone far enough? With procedures like these, why *should* the supervisor have any interest in safety? Why should he feel that management wants *him* to accept any responsibility for safety, or is even *letting* him have any responsibility or interest in safety? It appears that everyone and everything is conspiring to take away from him any feeling that he is responsible for safety in his department!

If the supervisor is the key to safety, how can we correct this situation? How can we get the supervisor interested in safety, get him to *understand* and *accept* his responsibility? We can do it only by *keeping him in the picture all the way:*

He must **know** when his men are hurt.

He must **know** when his schedule is slowed down.

He must **know** when his quality is down.

He must **investigate** every incident which affects his men, his schedule or his quality.

He must **participate** in the training of his men.

He must **understand** how this approach benefits **him** through a smoother operation, less headaches, fewer injuries and his personal advancement with his employer.

Use This Supervisor's

Such a program calls first for understanding by management and the necessary policy position. It calls next for supervisory training. Supervisory training has too often been considered the premise solely of large companies with training departments and adequate budgets. And numerically, we probably have more supervisors in small companies than in large.

We, in the insurance business—at least my own Company—deal with these smaller companies as well as the large. The supervisors in these smaller companies must also be trained if the job of accident prevention is to be accomplished.

Some people may have different ideas on how to control accidents and how to investigate accidents—or at least on certain details. I cite our principles and methods because they work for us.

Responsibility for Safety

What is our approach to the problem? It is an all-out dedication to the principle that *complete responsibility for the control of accidents must be placed upon line management.* This is based on the premise that the same conditions causing accidents are causing other types of losses such as damaged equipment, delays, waste and inefficiency and poor public relations. If it is the whole supervisor who gets the job of accident control accomplished we are immediately faced with the fact that we must have *good* supervisors, *well-trained supervisors* who will accomplish accident control as part of their total job.

Therefore, we began to put a training program together. For a few years after World War II we experimented with various methods of presentation, and in 1959 engaged an outside management consultant to evaluate the program, give it a little polish, and further train our men in the conference method. Starting with an intensive two-weeks training institute in Hartford, we have spread this training throughout our organization.

At the present time, we have over 150 field engineers trained in presentation of our materials. We have specially trained individuals in selected areas qualifying for our complete program, which consists of nine one-hour conferences.

Let me make it clear that supervisory training conferences are not the only answer to the problem. Conferences are used only if there is a need. This training can be given to individual supervisors on the job. In a conference you can get across important principles in an economical manner. The exchange of information and interplay of ideas, which the experts call "group dynamics," can be one of the best ways to train if the conference leader himself is well trained. Literally thousands of supervisors from the smaller companies have participated in conferences held by our representatives during the last few years. We make our materials available to the larger companies with training departments, and counsel their trainers on the proper uses of this material; they do their own training.

These conferences have only one objective—to help the companies whom we insure reduce their claim costs by preventing accidents. We know that these accidents are the result of operating conditions which the supervisor of a department is in the best position to control. If he is trained to look at accidents in the same way as all other aspects of his job, he will be in a better position not only to control accidents, but to improve his total performance as a supervisor.

Give Him the Tools

This is why we are making available to supervisors *the tools* by which they can better control their accidents and other operating problems. We believe this is what makes our approach so effective.

It is first necessary to establish the relationship between accident control and operations control by identifying the supervisor's responsibility for recognizing and controlling conditions within his department. This must be done so he can understand *why* this is his responsibility. We then outline an orderly plan for investigation of conditions which either *have caused* or *can cause* these losses. Using the case history method, the supervisors bring in examples which they have investigated, with on-the-job assistance of the insurance company engineer. This expert assistance in preparing his case is important, because it assures that the supervisor will not fall down when he makes his presentation. It also prepares the conference leader in advance for what is going to be brought up.

In subsequent conferences we discuss the knowledges and skills which a supervisor must have to do his job properly. We introduce the principles of the skill in planning, the skill in instructing and the skill in leading or job relations so he will understand them and their application to employee accidents and general operations. *We do not try to teach these skills to the supervisor.* This is a job for management. We merely demonstrate the application of these skills to the problem at hand.

Rather than a fixed series of "canned" presentations, these conferences are designed to use local examples and materials as much as possible. Certain conferences are stressed or omitted according to the needs of the particular company. As much as possible, every program is "tailor made" to suit the circumstances.

These conferences stress supervisory investigation as the tool whereby the supervisor puts all these skills and knowledges to work on the job. It helps the supervisor develop an orderly method for tackling his daily problems. We emphasize strongly the questioning

(Continued on page 8)

Report Form

Question #1: "What happened?" The supervisor should describe what took place or what prompted this investigation. The investigation may be the result of an injury to an employee, an incident that caused delays or damaged material, a machine breakdown, or ideally, some condition that is recognized as having the *potential* for losses or delays.

Question #2: "Why did it happen?" The supervisor must get all the facts by studying the job and the situation. We provide a pocket-size card as a guide or reminder for the kind of questions he should ask; but do not limit his thinking to such as the following:

Why does this situation exist?
Why is this job necessary?
What caused the situation to develop?
What is the purpose of this detail?
What details can be eliminated?
What instructions were not followed?
Where else does this situation exist?
Where should this job be done?
Where can I find out?
Who is best qualified to do it?
Who can give me answers?
How can this condition be corrected?
How is the best way to do it?

Question #3: "What should be done?" The supervisor must determine what aspects of his equipment, material and people require additional attention. The purpose is not to establish responsibility or to place blame. Rather, it is to determine what kind of constructive action can be taken to give a practical solution. Frequently, the actions that are possible are not going to be practical. The supervisor must try to select those which are.

Question #4: "What have you done thus far?" Here the supervisor indicates what he has actually done or what he is going to recommend, depending upon his authority. He also tells what he has done to follow up the action, and whether this action has proved effective. No investigation is worth the time it takes unless some constructive action takes place.

SAFETY INVESTIGATION FORM

Name _____
Department _____
Machine or Operation _____
Date _____

1. What happened? _____

2. Why did it happen? _____

3. What should be done? _____

4. What have you done thus far? _____

5. How will this improve operations? _____

Question #5 (One of the most important of all): "How will this improve operations?" This is where we identify the ways in which the proposed action will be of value, not only in terms of accident control, but also in total operation control. Good answers help the supervisor sell his ideas to the boss. They also help sell the supervisor himself on how the action will benefit him, other supervisors, and his employees.

Accident Investigation Case Histories—
What Have They in Common?

1. In a New York truck body plant a welder was rotating the fixture holding a truck frame. As he turned the fixture, the frame fell to the floor and was extensively damaged. The supervisor immediately investigated. He questioned how the frame was being turned, why it had to be turned, and how the frame had been hooked up. He asked why the job was done this way, and what would be the best way to do it.

Although the workman had not hooked it up correctly and this had caused it to fall, the supervisor also questioned why the fixture did not have two turning hooks, one on each end of the frame. His suggestion for improvement was readily recognized and the change was made. The two hooks supported the frame more firmly and permitted turning more quickly and easily. The possibility of the frame dropping was almost completely eliminated, preventing future damage to product, delays and possible serious injury.

2. In the West, a gas transmission line had to be blown down to make repairs. The main-line tap gates were not properly manipulated and as a result a small town was deprived of gas. Also, the tap valve leaked after it was closed, causing some problems. The supervisor immediately began to question the situation. He found that the gate lay-out was not standard and the operator had opened the wrong valve. Either he was unfamiliar with the lay-out or had forgotten it.

After questioning whether it was practical to change the lay-out, the supervisor proposed making a diagram for each gate lay-out and sealing the diagram in plastic for posting in the regulator house adjacent to the junctions. Also, a plug type valve would be better suited than the 4" tap valve then in use. The benefits of the changes were readily seen: prevent a recurrence of the operator's mistake, save time in operating the valves, eliminate the need for overtime pay and repairs, prevent customer complaints and dissatisfaction and the very real possibility of a serious gas explosion. The plug type valve would be less prone to leaking and easier to maintain.

3. In a Midwest aircraft plant a hydraulic table carrying a steel plate was being moved. One of the table's casters struck a hole in the floor, causing the caster to break and the heavy steel plate to fall to the floor. The foreman studied this job and found that the plate should have been clamped on the table.

Questioning indicated that there might be an easier way to do this job. He suggested using die carts rather than tables, reinstructing all employees concerning the clamping of such work, and repairing not only this hole but also checking all similar aisleway floors. These suggestions would eliminate the possibilities of similar incidents that might injure employees and damage equipment or materials.

4. At a construction site on the East coast, the boom of a fork lift truck hit and knocked down some electric lines. The wires and poles came down on top of the trailer office and damaged it. Questioning the situation, the foreman found that it was necessary to transport bricks on the fork lift and that the wires were necessary to provide temporary electric service. But he found that the bricks had not been unloaded at the best location on the job, nor had the electric wires been located properly.

He questioned why such electric lines could not be placed underground and why future stockpiles could not be placed closer to the job. The changes would save time in moving bricks, eliminate interference from overhead lines, and remove the possibility of electrocution or damage from similar incidents in the future.

technique through use of questions such as *"why," "what," "where," "when," "who"* and *"how."*

Safety Investigation Form

We suggest a form on which he can record his answers after the investigation is completed. Actually, the form itself is not very important—probably a blank piece of paper would do just as well—but a form does help organize the answers in a logical manner. In addition to the usual heading to show name and date, etc., it asks only five main questions. See the chart on page 7.

Then look at the four case histories (on this page) of how this investigation procedure works. These four incidents were taken from our files, on four different types of operations and from four different parts of the country. What do they all have in common? You may have recognized some of the following:

a) in not a single case was there any personal injury.

b) in every case the occurrence was investigated on the job by the supervisor responsible for that job.

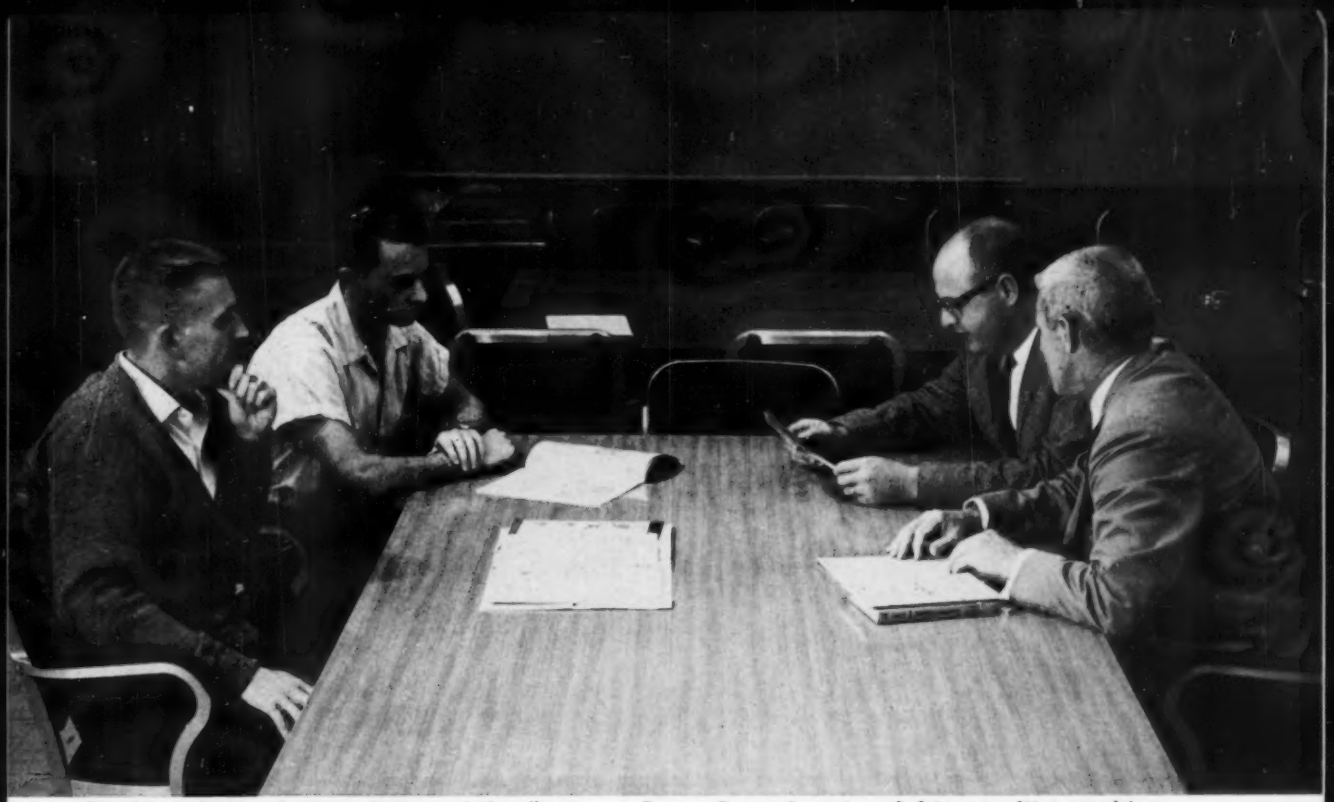
c) in each case the supervisor used the same well-organized investigation procedure to find out why the incident occurred, what should be done and either took or recommended to his boss the appropriate corrective action.

d) in each of these cases, there was a very definite improvement through a saving in time, prevention of future damage to valuable equipment or product, and elimination of a serious accident potential **before** any injury occurred.

Let me emphasize, in every one of these cases **the job or operation was improved.**

The similarities noted are more than a happy coincidence. All four of these supervisors had been trained in an *organized method* of investigating conditions which interrupted or interfered with the orderly progress of their jobs. They

(Continued on page 22)



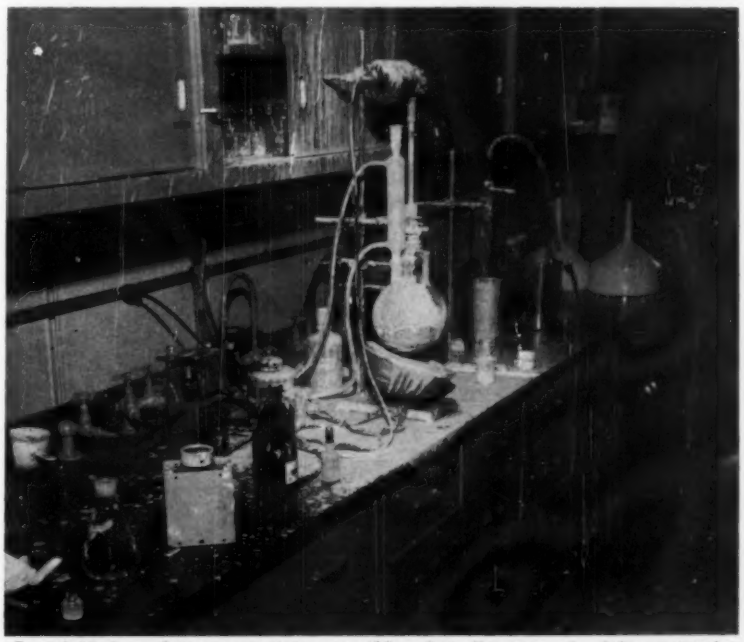
Chemist, engineer and personnel representative discuss their ideas with the safety engineer at Ohio Oil's Denver Research center. Safety committee consists of three revolving members and the safety engineer.

PREPARING FOR THE UNKNOWN

Working with unknowns can be a hazardous business. Yet it's part of the everyday job at the Ohio Oil Company's Denver Research Center. Their experiments may require radioactive materials or high pressures, and the substances they work with may be toxic, flammable or explosive.

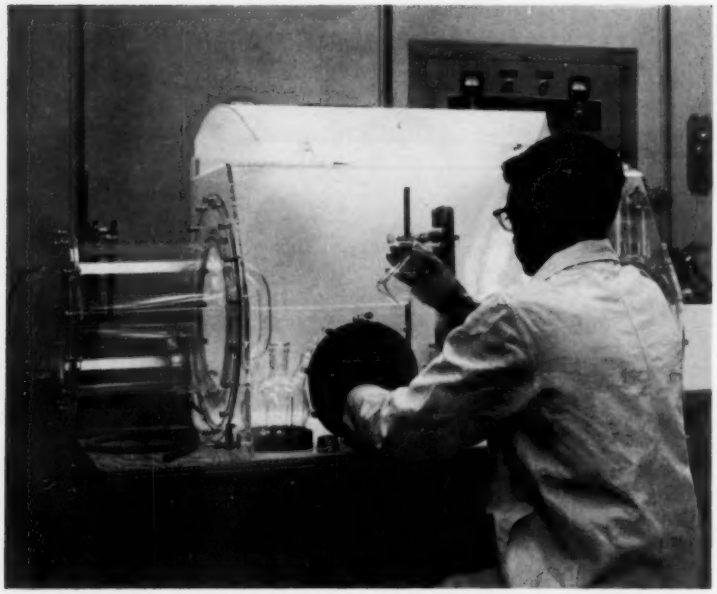
While the potential dangers associated with the work are great, the personnel at the Research Center are acutely aware of them and of the need for practicing safety in their work. Ohio Oil's safety department, Research Center employees, and research management have always joined efforts to make the Center a safe place to work. K. Zimmerman, supervisor of safety, remarked, "The Denver Research Center from its very beginning was designed for safety, and it has had an efficient and continuous program in effect ever since."

Pictures from Ohio Oil Co.



Foresight in safety prevented everything but the mess in this particular experiment. An electrical heating device, mandatory at the center, made ignition impossible and a special ventilator quickly cleared all vapors.

PREPARING FOR THE UNKNOWN



Technician performs an experiment in a "dry box." Box is purged with inert gas to prevent spontaneous combustion during an experiment.

Many tests use or produce gas. If harmful accumulation occurs, gas masks mounted on the walls in each lab wing are readily available.

A shower which puts out 40 g.p.m. is provided in each lab in the event of an acid spill on an employee. The other safety equipment is standard in all labs.

These supervisory personnel perform routine checks on high-pressure vessels. This safety group tests all pressure before they are initially used and afterwards to insure safe working limits.

RIGHT—Sign on the door indicates chemist is working with radioactive materials. Much of equipment is encased in plastic shield to protect against injury.

Supply clerk uses a special four-wheeled cart to prevent a possible accident during transit.

Located at the rear of every lab in the research center is an escape hatch, which a chemist uses here.

Is Your Materials

by **RUDY PELLMAR**
Plant Manager
Electrical Fittings Corp.
Woodside, N. Y.

If you hear anyone in your plant say, "*Oh my aching back!*", take him seriously. Your materials handling is showing. . . .

A large percentage (12% to be exact) of within-plant reported injuries are sprains and strains.

The United States Dept. of Labor recommends that male workers can safely lift and carry a maximum of 50 lbs. in compact form in continuous and repetitive operations and that female workers can safely handle a maximum of 25 lbs. under similar conditions. Our experience indicates that, even if we kept within these recommendations, there would still be claims filed for back injuries. For example, even when we restrict the amount of weight and effort to be exerted, some "eager beaver" will lift two or three of these units at one time. The result is the filing of an accident report. The only way to really solve this problem is to take the load off the peoples' backs by using modern techniques of mechanical material handling.

There are available fork lift trucks with their many attachments, conveyors of many types and varieties, hoists, cranes, etc., etc., to take the load off the materials handler's back. This equipment with proper application and design can do the job of transporting material from one operation to another much more effectively and efficiently than brute force. An analysis of accident reports in a plant showing a large percentage of recurring sprains and strains should indicate to the person responsible for the over-all efficiency of the plant, that his materials handling techniques and plant layout need evaluation.

Mechanical Handling Cuts Costs

The Electric Industrial Truck Association, in making a comparison in the cost of materials handling, based their comparison on horsepower. Their figures show that if manpower is used the cost is approximately $10.00 per horsepower. If electric equipment is used the cost is only $.04 per horsepower. This is a ratio of 250 to 1. And, this is only a cold statistical comparison of the cost of the effort. When you consider the hidden costs of manpower fatigue, morale and materials handling injuries, this extremely large ratio becomes even greater.

Some recent surveys indicate that materials handling accounts for about 40 percent of the labor payroll in the manufacturing industry. An effort of this magnitude requires serious consideration. Although many plants have improved their fabricating operations and have spent a great deal of effort in reducing the manpower requirements to *fabricate their parts*, they have given little or no consideration to the *flow of materials*.

Mechanical conveyors are the least expensive way to move items whenever large quantities follow

✓ *Materials Handling* SERIES

Other Articles: June and August

SYMPTOMS OF HANDLING

1. A high incidence of indirect labor costs
2. A high accident rate for materials handling employees
3. Skilled employees required to move material to and from machine
4. Frequent production

Handling Hurting?

the same path. In large-volume, mass-produced products, conveyors are a natural. One of the advantages is that very small aisles and little storage space are required. Another advantage is that overhead space is efficiently used since many of the conveyors are hung from the ceiling. Also, if the operations are not balanced, storage bins can be placed in a conveyor system from which another conveyor can pick up, orient and deliver to the next operation.

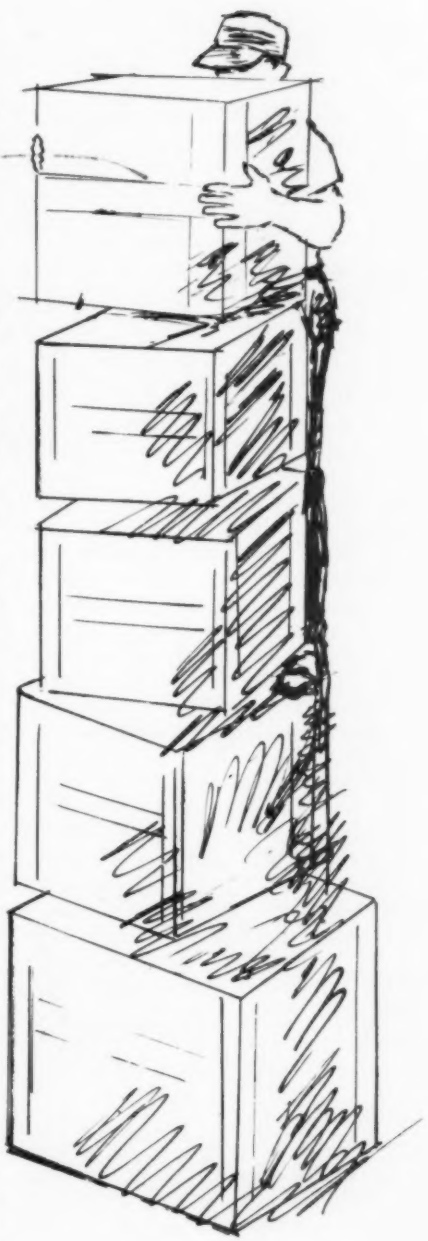
If the operation is of an intermittent or batch type of production, fork lift trucks and various types of totepans or containers lend themselves to efficient materials handling. There are containers available which can be lifted into position and automatically dump the product; and then, by means of a chute on a stand, deliver the material to an operator at a point convenient for the fabricating operation. Another advantage of totepans, especially if they stack upon one another conveniently, is the utilization of air space; as most plants do not have adequate floor area.

Often a combination of these two fundamental methods of conveying material, the fork lift truck and the conveyor, can be used in conjunction with each other.

Case History

A few years ago our own company's materials handling "was showing." Castings were stored in 55 gallon drums and stacked on top of each other on 2 x 4's by two men riding on an elevator. These barrels were moved from one end of the shop to the other by hand trucks. These same barrels or parts were lifted by small chutes onto tables to make them available for the machine operators. Cartons of finished material were stacked on top of each other by one man standing on top of a teetering pile, while another man below him threw cartons (weighing approximately 40 lbs.) to him. No wonder the accident rate for sprains and strains was high! Also, a great deal of manpower was being used for this transportation and storage. After a thorough analysis of this situation, the progressive management decided to budget the funds necessary to revise this materials handling set-up.

Since the product (which consists of approximately 800 different items —many of which are made of 3 to 5 components) breaks down to a batch production type of operation, the use of fork lift trucks and self-dumping containers was a natural recommendation. We completely revised the layout of the plant to allow the proper aisle space for the fork lift truck operation and also for placing these containers on



MATERIALS DEFICIENCIES

delays caused by bottlenecks in the flow of materials

5. Large quantities of materials damaged in handling

6. Inefficient use of storage space by not availing oneself of headroom for stacking material

specially designed stands, so that the parts would be delivered to the machine operator at the optimum position for efficient machine feeding. The processed components were delivered to another container of the same type which could then be moved, on the same types of stands and in the same manner, to secondary or other operations. The packing benches were also laid out in this way. After packing, the packed materials were laid out in pallets which could be moved readily to the back of a truck for shipment or to some point within the plant.

With these changes our previously high sprain and strain incidence declined almost to the vanishing point. Of course, there was a considerable investment, but the improvement in efficiency made it a very satisfactory investment. As a by-product, the morale and housekeeping of the plant were considerably improved.

Analyze Material Flow

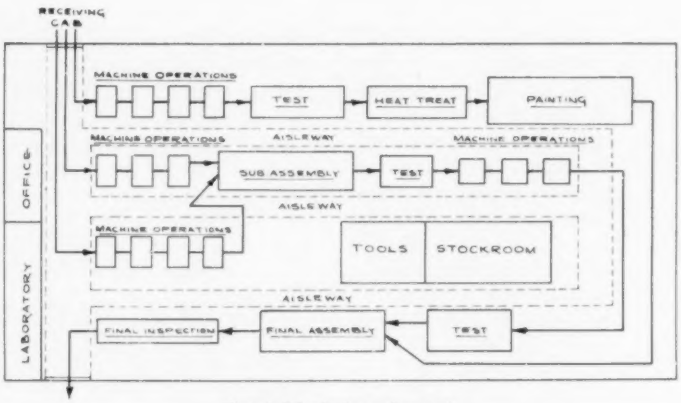
The secret of the success of this materials handling program in this plant was that a thorough analysis of the flow of material within the plant was made, and as a result of this analysis, a plant layout was made. A program was laid out for a major change and a uniform method of materials handling for all products was attained. Standardization of procedures is very desirable because of its inherent efficiencies and the resulting reduction of confusion and mistakes.

Materials handling must be analyzed as a system because it is common to all operations. It implies changes in scheduling, machine utilization, inventory levels and so forth. Therefore, the full consequences of the change must be analyzed. A master plan is desirable, in fact a must, because a radical revision of in-plant materials handling cannot be made overnight. But, the small changes that are made weekly or monthly, and the new products and equipment that are introduced, should fit into a master plan of getting where you want to be several years from now.

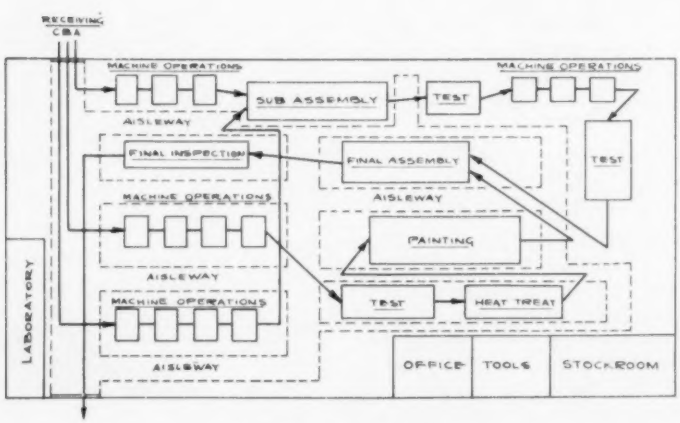
Not all plants can be, or need be, changed as drastically as the example given. However, after a review of your plant's materials handling, a safer, more efficient, more economical operation can be evolved by the use of modern materials handling equipment.

The check list of materials handling deficiencies accompanying this article can be used as a test of your present system. If any of the items on this check list apply to your operation, then a review of your materials handling situation is indicated.

In conclusion, let me emphasize (especially to those responsible for plant efficiency): use your accident reports for indications of your sore spots or as a symptom of management deficiency in various areas. This analysis of the problem can bring gratifying results both from the standpoint of plant efficiency and safety.



Good Workplace Layout



Poor Workplace Layout

From an address presented at the 30th Greater New York Safety Convention. Work layouts by courtesy of U. S. Dept. of Labor.

Southeast Maintenance and Engineering Show

The third annual Southeastern Show, a plant maintenance and engineering exposition sponsored by the three state chapters of the American Institute of Plant Engineers, will be held at Greensboro War Memorial Coliseum September 12–14.

The group will also sponsor a Plant Engineering and Maintenance Seminar to be held at the adjoining Town Hall. J. R. Ogburn, of the Industrial Extension Service staff

(Continued on page 58)

Maintenance man shows how urethane paint is applied to 8,000-gallon tank car at Allied Chemical's Ohio plant.

PLASTIC PAINT LOOKS PROMISING

To confirm the outstanding resistance of urethane coatings to corrosive chemicals, abrasion, and weathering, Allied Chemical has sprayed many of its railroad tank cars with urethane paint. Among them are 20 from the Nitrogen Division, four from the National Aniline Division, and two from the Plastics Division.

Spillage of chemicals permanently stains the paint presently being used and removes its gloss. The splash of grease from the wheels, the strong caustic washing solution, the abrasive effect of cinders, and the year-round exposure to weather elements also help to destroy conventional coatings.

The use of new urethane paint on the company's tank cars is expected to provide an extra-tough coating which will keep the tank cars attractive considerably longer than conventional paints.

Before painting, the Nitrogen Division tank cars were thoroughly sandblasted using a 600 cubic-foot-per-minute air compressor. The division's South Point, Ohio, plant formerly used a 300 cubic-foot-per-minute compressor, but it was found that it did not give satisfactory cleaning and a proper base surface for the urethane paint. Jim Broadbent, Senior Engineer, finds that a high grade flint sand which has less than 10 percent breakage upon hitting and which will go through 16 mesh but be retained on 30 mesh will give the best sandblasting results.

Surface Preparation

Mr. Broadbent stresses the importance of good surface preparation. He says the surface must be free of dirt, grease, rust, moisture, and loose paint before the new coating is applied. Otherwise the finish may lift or develop rust pits over the unclean areas. It is also recommended that the tank cars be painted under shelter if possible to keep the bare metal from being hit by rain or excessive dust.

Urethane paint was applied to the cars with a spray gun using 10 to 15 p.s.i. fluid pressure based on

(Continued on page 25)

MESSAGE WITH A LIFT!

A dummy with a flat head, fleshless plywood "bones" and a trick spine is helping prevent back injuries at all Dayco Corporation plants and warehouses. And even though he has a wooden head he's no dummy when it comes to getting his point across.

Without a word he lets employees see for themselves that even heavy objects can be lifted without injury or strain. Nothing happens when he picks up a load the right way. But when he lifts incorrectly —**b-O-i-n-n-g-g** goes his backbone!

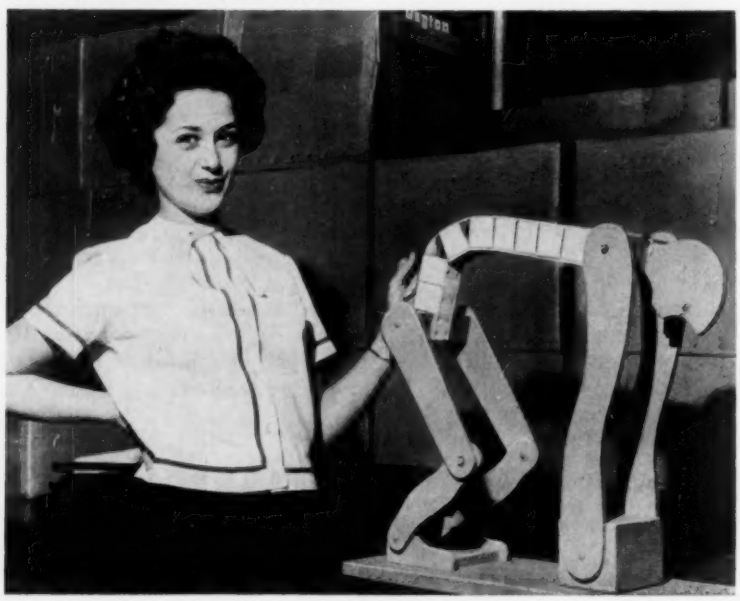
Introduced at Dayco Corporation's Dayton Industrial Products Division in Melrose Park, Ill., the device is part of a long range program to teach proper lifting techniques to employees in all divisions of the corporation. The dummy will impart a silent but unmistakable message to employees in manufacturing as well as warehousing operations.

The device works on a simple leverage principle. There are movable joints at the ankles, knees, hips and shoulders. The backbone is a series of wooden blocks held together by elastic strips. The employee provides the lifting power by means of a handle at the base of the dummy's spine.

With the load properly placed, the dummy's knees are bent and the back is straight—almost vertical. When the employee applies pressure to lift the load, maximum strain is placed upon the dummy's legs instead of the back and he reaches a standing position without mishap. But when the load is too far forward, the dummy's back is forced

Keep spine straight when lifting. Here dummy is used to prove the point.

"My aching back!" Improper lifting draws sympathetic gasp from employee.



Dummy Keeps Mum-But Gets Safety Theme Across

to bend putting it under a strain. When the employee tries to make the dummy lift the load in this position, the extra stress causes the backbone sections to separate.

"The result is a startling message which instantly gets through to everyone," said Ray Hart, safety director for Dayco. "We could talk all day about the right and the wrong way to lift and still not reach a lot of people. But thirty seconds with this little device and every man is thoroughly impressed. He may not remember an hour long lecture on proper lifting techniques but he's not likely to forget this demonstration," he added.

It Can Happen Here

The abrupt misfortune which befalls the dummy is startling but is not without its comical side. Virtually every person seeing the demonstration for the first time is inclined to laugh when the backbones part company. However, the laughter is quickly replaced with the sobering realization that this is what frequently happens to the spine.

Hart pointed out that approximately one-fourth of all disabilities suffered by American workmen are caused by improper handling of materials. "This tremendously wasteful assortment of strains, sprains, hernias and other injuries makes the need for an educational program in correct lifting procedures obvious," he said.

"If we can even prevent one single serious and painful back injury, this little gadget will be worth its weight in gold," Hart said. "And with the reaction employees at our various divisions have shown to this demonstration," he continued, "I'm sure we'll prevent a lot of injuries. Keeping the back and elbows straight and bending the knees until the hands grip the load is the only safe way to prevent back injuries when lifting—and this little fellow proves it!"

Picture by courtesy of Dayco Corp.

PORT-O-RUNG
U. S. Patent 2,945,549
Foreign Patents Pending
Auxiliary rungs to replace any rung, and any number of missing rungs, in all permanently installed upright ladders.
GAGNON ENTERPRISES
77 River Street, Hoboken, New Jersey
SWarthmore 2-0662
(For details, use Key # G-4 on card, page 33)

This leaking drum, containing a chemical, was repaired on the spot in transit with an epoxy resin compound.

Epoxy Licks Leaks

A leaking metal container, a problem anywhere, is likely to be a more complex problem for the motor carrier than for anybody else. When defective containers in transit contain substances such as chemicals, then the trucking company may have a real problem on its hands.

A drum containing a chemical that is found to be leaking in transit usually must be removed immediately before other freight in the shipment is damaged. The faulty container can neither be shipped on to destination nor returned to the shipper.

What may seem an obvious solution—transfer of the contents to a drum that does not leak—may not be possible because of the danger of contaminating the contents. Many shippers, in fact, prohibit removal of their products from an original container during transit for this reason.

Repairing the faulty drum on the spot frequently is the only solution. But any patching material used must have exceptional strength and holding power if the repair is to last throughout the trip. The repair must withstand not only what may be a long trip but also perhaps one or more transfers en route.

One major carrier, long concerned with finding an effective solution to the leaking container problem that plagues the trucking industry, now uses an epoxy resin compound for on-the-spot repairs. The carrier, Arkansas-Best Freight System, Inc., Fort Smith, Ark., handles large quantities of chemicals and other substances that require exceptionally careful handling in transit. The company serves an extensive 10-state area, stretching from Cleveland to San Antonio.

After trying a number of repair materials, the carrier decided to repair a defective steel container with an aluminum-filled epoxy resin compound on a test basis. The drum was a 55-gallon single-trip "veteran" made in 1948. Due to its advanced age, a split approximately 1½ inches long had developed on the side.

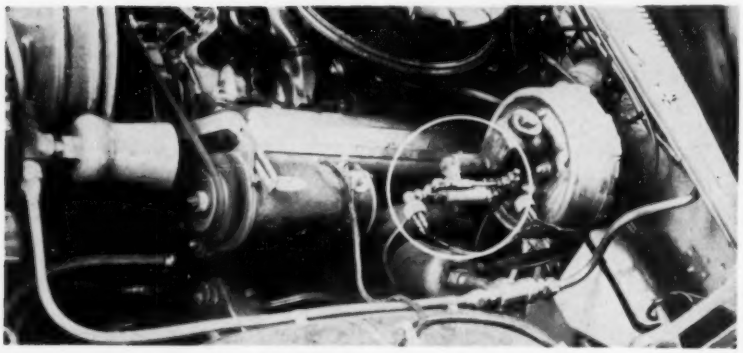
First the drum was laid on its side and the surface around the rupture was thoroughly cleaned. The epoxy material which is packaged for one-for-one mixing by either weight or volume, was then applied to the repair area in the amount required.

The repaired drum was allowed to sit on its side for 24 hours. The following day the drum was set upright, tested and found to be leak-tight. As a result of the adhesive properties of the epoxy compound, the drum could be forwarded to destination without any further leakage.

As a result of this successful repair, the epoxy compound is now kept in supply at each of Arkansas-Best Freight's major terminals. It is available for immediate patching of any containers discovered to be defective in transit, provided the contained material is suitable. Savings are expected to be considerable.

Picture by courtesy of Smooth-On Mfg. Co.

Survival Car II Packages the Passenger for



Braking safety is assured by the use of an in-the-line safety brake device, designed as a shut-off for either the front-wheel or rear wheel sections of the hydraulic brake system.

In May of 1952, Frank Crandell, chief engineer of Liberty Mutual Insurance Company, proposed to management that the company should gather and analyze all available statistical data concerning the type, frequency and causes of injuries and fatalities resulting from automobile crashes; secondly, that they should determine how these crash injuries might have been alleviated by proper design and application of safety devices.

Experimental Car

As a further step, he also suggested that a research program be undertaken based upon this data with the aim of designing new safety features to eliminate or modify the seriousness of injuries. Additionally, it was also proposed that, with Cornell Aeronautical Laboratories, an existing automobile be reconstructed in order to incorporate these injury-reducing safety features and that this experimental car be made available for public display and demonstration.

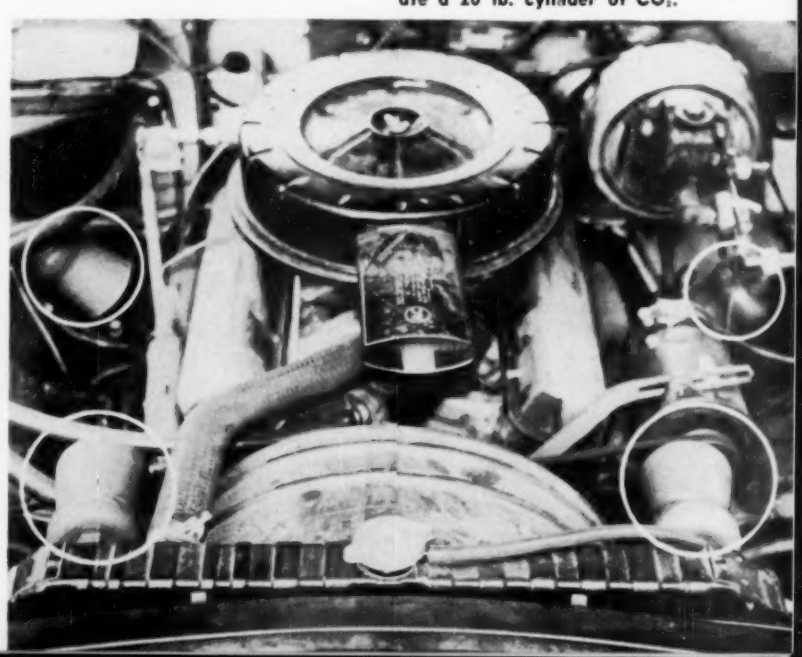
The original Liberty-Cornell "Survival" car was created as a result of this proposal and was introduced to the public in 1957. Externally, the car resembled a conventional, contemporary four-door sedan. However, the inside of the car differed radically from conventional design. With more than sixty new safety features, the car was in fact unique.

Essentially the 1957 car provided a completely "free envelope" for the occupants. It would prevent a rider, when restrained only by a seat belt, from striking any part of the automobile during a collision. An ideal safety vehicle, it was designed to permit the passengers to walk away from a head-on collision at speeds up to 40 MPH. This car aroused enormous public interest and attracted the immediate attention of the automobile industry because of its numerous safety innovations. Many of the original safety concepts first introduced in this car have since been adopted by the leading automobile manufacturers in their standard models. Significantly, the auto industry has now decided that all cars from 1962 on will be constructed with basic fittings for seat belt installation.

Second Car

The new "Survival Car II," the successor to the "Survival" car, is a four-door sedan with a conventional center post for added roof strength and is, in fact, a completely functional and operational 1960 model BelAir Chevrolet. It thus differs from the original Cornell-Liberty Survival Car of 1957 which was clearly a theoretical prototype. But it is a logical extension of the

An automatic fire protection system has been installed in the engine compartment. Upon any abnormal temperature rise this fire detector system will actuate a 20 lb. cylinder of CO_2.



Safety

over-all research program in auto safety.

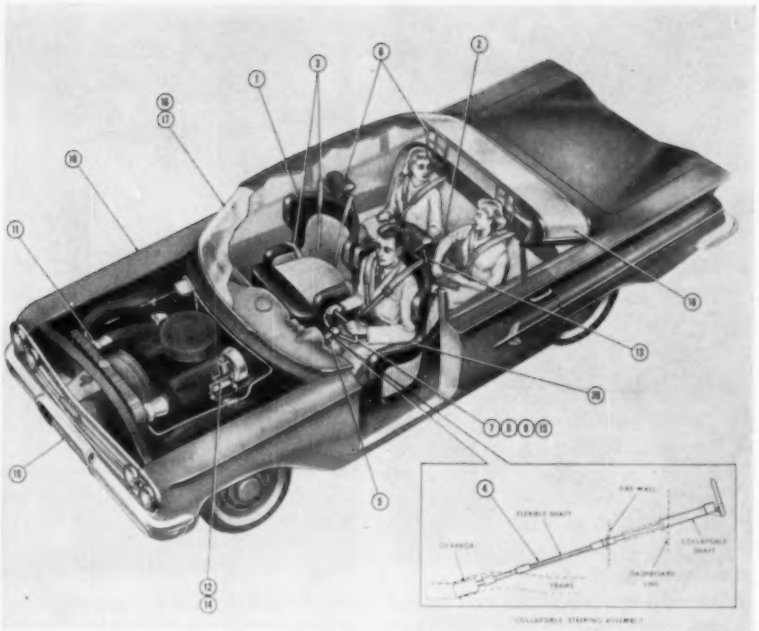
In measuring the interior dimensions of the three commonly called low-priced cars—Chevrolet, Ford, Plymouth—it became apparent that there was insufficient room inside the passenger and driver compartment to safely restrain the travelers through utilization of the basic safety principles used in the prototype Survival Car.

Restraint in the original Survival Car was primarily at the hips of the passenger and driver. This meant that a sufficient envelope of movement had to be made available in the event of a front-end crash so that their heads would not hit the automobile or come in contact with each other.

Necessary Clearance

Based upon scientifically controlled crash tests, the necessary clearance of movement for an average person would have to be approximately 45 inches. Measurement of the interior showed that the maximum distance between the front seat and the instrument dashboard averaged 27 inches. The distance between the location of the hips of the rear-riding passengers and the front seat was 26 inches maximum.

At the outset, it was Crandell's intention to overcome this short distance of rear seat clearance by moving the seat back towards the trunk. However, the configuration of the 1960 low-priced cars did not allow this because of the low height of the rear window. Moving the rear seat back would not allow sufficient head room for the occupants. The immediate problem that faced the engineers was to redesign the known hazards out of the car in order to reduce the effects of injuries in a crash. Owing to their program of research and experimentation for the Survival Car, they knew



24 SAFETY FEATURES OF SURVIVAL CAR II

1. **Capsule chairs, so designed and so tied to the floor, that they restrain the driver and passengers in a 30 MPH collision against a:**
   30 g Front Crash—5,000 pound load.
   30 g Right Crash—5,000 pound load.
   30 g Left Crash—5,000 pound load.
   30 g Rear Crash—5,000 pound load.
2. **Protection of passengers in rear seat against a 5,000 pound load.**
3. **Restraining lap belts and shoulder harnesses on all seats.**
4. **Flexible steering shaft that will buckle in a crash situation. This prevents driving of the shaft into the driver's chest.**
5. **Steering tube that telescopes a total of 8 inches during a crash in order to prevent injury to chest and face of driver.**
6. **Whip-lash protection on all seats to retain the head up to a force of 500 pounds in the event of a rear-end crash.**
7. **A rectangular steering wheel to prevent breaking or bruising of kneecaps when the wheel telescopes into the dashboard and instrument panel in the event of a collision.**
8. **Steering wheel of reduced diameter for greater driving visibility.**
9. **Improved maneuverability, faster turning ability and greater driving stability through utilization of this special steering wheel.**
10. **Unit body construction with high energy absorption factor—will collapse and ruin car at moment of severe impact—and protect passengers from bodily injury from the front, rear and both sides of the car.**
11. **Automatic fire control system, utilizing carbon dioxide to smother any fire in engine compartment.**
12. **Safety brake device. Should one of the hydraulic lines to the brakes fail, the unit will allow two-wheel brake operation.**
13. **Roll-over bars in capsule chairs.**
14. **Power brakes.**

(Continued on page 21)

that the greatest protection for the driver and passengers could be achieved by basic redesign of the car's interior.

Design Considerations

Through crash testing techniques it was determined that it was of extreme importance that driver and passengers be restrained against forward deceleration and rearward deceleration forces. In intersection accidents, the traveler must also be restrained in the lateral direction where these lateral forces are equal to the deceleration forces.

For a 30 MPH collision, the design criteria, therefore, should be as follows:

1. Design all restraining devices for a head-on crash equal to a deceleration force of 30 g's.

2. The design forces for the lateral intersection crash should also be of the magnitude of 30 g's.

3. The design criteria for the whiplash of the head in a rear-end accident should be no less than 12 g's.

In order to overcome the lack of movement clearance in today's automobiles, the decision was to contain the passengers in capsule-like chairs so as to minimize body and head movement in a collision. Initial analysis showed that it would be necessary to protect the driver and passengers in all 360 degrees —to the front, at the rear, and at both sides.

Capsule Chair

The first consideration was the proper design of the capsule chairs that would replace the conventional front seat. These chairs because of the strong deceleration forces involved in a crash have sufficient strength to withstand a 5,000 pound blow from the front, the left, the right, and the rear. The arm rests provide one of the protective mediums in a side crash, either from the left or right. The wings of each chair afford the same protection at the shoulders of the driver and passengers.

Because of their size and shape, and in order for the driver and passengers to enter and leave the vehicle with little or no difficulty, both "front-seat" chairs were designed to swing in either direction or be rotated through a full 360 degree circle. In addition to the swinging action, the driver's capsule chair must be adjustable forward and back to compensate for different leg lengths of various drivers.

The chairs alone will contain the driver and passenger in any "action" from the rear and both sides. A lap belt and shoulder harness provide for forward containment of the occupants.

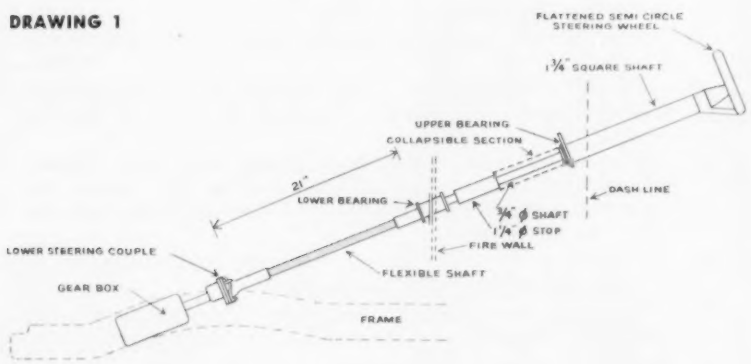
In order to overcome hazards caused by projection of the steering wheel rim or post into the chest or face of the driver in a crash, this collapsible steering assembly was adopted.

For safety, each chair is securely fastened to the floor of the car by a steel casting. Four slots milled into the two angle bars allow for movement of the assembly's heavy ¾ in. bolts to go forward and back to a maximum of 4 inches. The center of the spider arrangement is set upon a 2½ in. pin that swivels in the bottom casting. This casting is designed to utilize a sufficient quantity of bolts to tie it to the floor of the car and mobilize enough flooring to equal a 5,000 pound thrust or load that could be expected in a 30 mile-per-hour collision.

The ability to turn the chairs in any direction allows the passenger to face the rear seat, with safety belts in place to restrain the body against the deceleration of an accident.

Whip-lash protection is also afforded the driver and the passengers. Attached to each chair, at the correct elevation for the head, is a cushion or net to protect the heads of all occupants during a rear-end collision.

DRAWING 1



COLLAPSIBLE STEERING ASSEMBLY

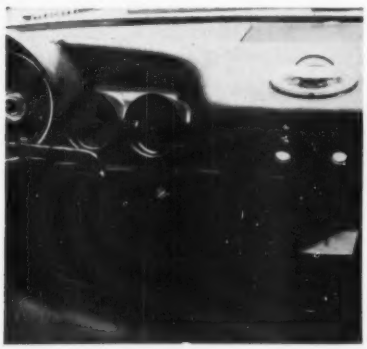
Steering

In the preliminary investigations, it was proven that the driver of a vehicle is subjected to two severe injury possibilities. They are:

1. Projection of the steering wheel rim into abdomen.
2. Projection of the steering wheel post, cracked or broken during a crash, into the chest or face.

To overcome these hazards, a collapsible steering mechanism has been developed. Essentially, it consists of a flexible shaft and a steering wheel which will collapse in a forward motion in the event of an impact with any other object. Drawing I shows the design of the flexible shaft and the collapsible steering wheel.

In addition to the flexible shaft arrangement, a telescopic tubing is attached to the dashboard of the car. Operating between the dashboard and the fire wall, it is installed so that the steering wheel will collapse in the event of any forward-direction impact with any foreign object.



Two light spots situated on the dashboard below manual control mechanism for the fire prevention system will glow when brakes are applied to show that hydraulic system is functioning.

There are two other important safety elements in the steering assembly. The rectangular steering wheel has been reduced to a very small, but comfortable size. It is approximately ⅔ smaller in diameter than the average steering wheel of conventional automobiles. It provides greater visibility for the driver, an important consideration when the driver is of small stature and has difficulty in looking over the rim of an average-sized wheel.

This reduction in driving wheel diameter is made possible because the car has power steering. It takes only approximately 7 pounds of pressure to turn the wheels with this power steering mechanism.

Configuration of capsule chair is shown here. Arm rests afford one of the many protective mediums in event of a side or lateral crash. Wings provide added protection at the shoulders.

The capsule chair alone, as previously indicated, will contain the driver in any "action" from the rear, the left side, and the right side. By itself, the chair affords no protection at the front. Therefore, engineers had to devise a method of containment so that the head and body of the driver would not contact any part of the car in a head-on collision situation. The method of containment consists of a lap belt with a special three-way buckle. This buckle will take the connection of the lap belt and the two connections of the shoulder harness. When the driver or passengers desire to release themselves, all they need do is lift the buckle's latch mechanism to disengage the three connections.

The shoulder harness straps crisscross as they enter the three-way buckle. This prevents the harnesses from causing discomfort or harm to breasts of female drivers or passengers.

These belts are fabricated from a lightweight chemical fibre material. The lap belt has a resistance to breaking of 10,000 pounds and the two shoulder harnesses have a resistance of 5,000 pounds. This affords a factor of safety of 3 against a failure of containment for the occupants.

In any mechanical assembly, the

hazards of fire are present. Therefore, a completely automatic fire protection system has been installed in the car's engine compartment. Upon an abnormal temperature increase, this rate-of-temperature fire detector system will automatically actuate a 20-pound cylinder of pressurized carbon dioxide.

The fire smothering gas will flood from its container and pass through a series of four multiple-jet nozzles mounted about the engine. These nozzles discharge the gas in a volume sufficient to envelop the engine compartment. By reducing the oxygen to a point insufficient to support combustion, the fire can be extinguished in a matter of seconds.

24 Safety Features of Survival Car II
(Continued)

15. **Power steering.**
16. **Laminated safety windshield with double-weight filler to afford greater resistance to penetration with no greater blow upon the head.**
17. **Tinted interlayer windshield to eliminate 95 percent of all ultraviolet rays and reduce driver and passenger eye fatigue.**
18. **Tinting of all glass windows reduces the heat load, normally entering the car through the transparent glazing, by approximately 30 percent.**
19. **Reflective license plates for greater visibility at night.**
20. **Support of arms to reduce driver and passenger fatigue.**
21. **Automatic signal system to awaken driver if he falls asleep or to stop the car if he does not awaken.**
22. **Micro-siping of tires to increase traction and reduce skidding possibilities on wet, icy and snow-covered roads.**
23. **Side reflection mirrors for greater driver visibility.**
24. **Smooth hood over engine to reduce hazards to pedestrians, if hit.**

If the system should fail to function because of mechanical damage, the system can be activated through a manual control located on the car's dashboard.

Safety Braking

Complete braking safety to passengers of the car is assured through the utilization of an in-the-line safety brake device. This unit is designed as a shut-off for either the front wheel or rear wheel sections of any hydraulic brake system.

The safety brake device is installed as a tee from the car's master cylinder to the two lines supplying the front and rear brakes respectively. Normally, its piston is held stationary by friction between the cylinder walls and a circumferential snap spring. In case of line failure, the piston is carried with the flow until it blocks off the exit port and, thus, will allow use of the remaining pair of brakes.

In the case of failure due to applied pressure of the brake system, a dangerous and common occurrence, the device will act to prevent the loss of appreciable amounts of fluid. In the case of an unrestricted failure, generally caused by a torn or cut line followed by brake application, the device will also prevent the loss of braking fluid. This latter condition is uncommon, but is quite dangerous.

Road Tests

"To date," states Frank Crandell, "our Survival Car II with its collapsible steering wheel, its capsule chairs and its containment of shoulder harness, lap belt and whiplash protection has been road-tested for more than 5,000 satisfactory miles. The capsule has shown itself to be extremely comfortable. The restraining harness and lap belt are so light that one soon tends to forget them. This is a decided advantage over the nylon belts that we first used. Their weight was always evident during our turns at the driving wheel.

"The fact that there are arm rests on the seat has produced an additional dividend. The support of the arms in driving reduces fatigue," Crandell continued. "The feeling of driving in this manner is one of guiding the automobile rather than steering it. Whip-lash protection is evident at all times. However, it was so designed that the head will not touch the protecting medium during normal driving conditions. But it is there in the event of a rear-end collision.

"The flexible steering post design, which includes the 21 in. section of flexible shaft and the telescoping wheel, has been road-tested for approximately 3,000 miles," said Crandell. "Under all conditions encountered—smooth roads, rough roads, dirt roads, ice, snow and rain-filled roads—the steering was very effective. It is safe to say that this flexible steering assembly has no detrimental effect on the steering ability of the car."

Liberty Mutual president Bryan E. Smith commented that "In the course of our intensive investigations into the causes of automobile crashes and accident-producing injuries, we believe that Liberty Mutual has opened a number of promising new frontiers in automobile safety and design. In sponsoring the reconstruction and design of this completely functional passenger car solely for safety our hope is that it will stimulate the forces already at work producing safer automobiles. It is imperative that there be a lessening of the fatalities and injuries now occurring year-in and year-out on our nation's highways."

Pictures by courtesy of Liberty Mutual Insurance Co.

"We have cut noise in the plant to a bare minimum

Accidents
(from page 8)

had been "sold" on the fact that such investigation was a logical *part* of their job—an *important* part which could help make their own jobs easier and smoother running.

They had received this training either from insurance company engineers or from their own training personnel, using material supplied by the insurance company.

Nowhere in these investigations did the supervisor limit his thinking just to *unsafe acts* or *unsafe conditions*. He was questioning the entire job, whether it was even necessary, whether there was a better way to do it, whether there was another time and place for doing it, an easier, quicker or more economical way of doing it.

When we talk about how to investigate accidents, we generally agree on finding the basic causes of the accident so corrective action can be taken. Management might well recognize a much broader objective:

"The objective of accident investigation should be to help supervisors develop a systematic way of thinking."

This is a skill or technique, rather than a knowledge, which can be developed only through use, through practice, but which helps the supervisor solve many of the problems he encounters and helps make him a better supervisor.

This does not mean the supervisor will wait until he has an accident or personal injury before he starts to investigate. And this is precisely the true meaning of accident **prevention**, removing the causes **before** the accident occurs. Proper investigation not only solves the problems which are past, but prepares him to avoid those which lie ahead. This technique is ideal for studying jobs which are causing problems.

Safety Supervision vs. Good Supervision

The supervisor has long been identified as the key to safe operations. We hear repeatedly about the probelm of arousing and maintaining supervisory interest to get

the safety job done. Much of this emphasis has been on *safety* supervision rather than *good* supervision.

This approach has not always achieved the desired results. Why? Because we cannot reach the basic interests of either supervision or management by merely talking about safety. Reduced to fundamentals, both management and supervision are interested in very similar objectives. Management is interested in production of goods or services, in making a profit and in healthy growth. Supervision is also interested in production, in job satisfaction and personal progress. Until we point our program toward the achievement of these interests we are not going to get the *best* results and in some cases not even *any* results.

Role of the Safety Director

And what about the safety director—does this emphasis on supervisory responsibility put him out of a job? Not at all! It can help him do the job he is dedicated to—eliminating accidents and accident causes. He occupies the position he should, as consultant to management; he assists in the training and in the continuing follow up. Under such a setup, he is able to function with maximum effectiveness as the staff expert on safety, rather than as plant policeman.

What do the supervisors themselves think of this approach? Supervisors are like everyone else. They want their jobs to run smoothly, so they can go home at night with a minimum of headaches. They have ambitions and want to get ahead. They want the boss to recognize their value to the company, and this is going to be measured in terms of the jobs they do as supervisors: how well they got out the production or services within their department, utilizing the equipment and the material and, most important of all, the people that are available to them.

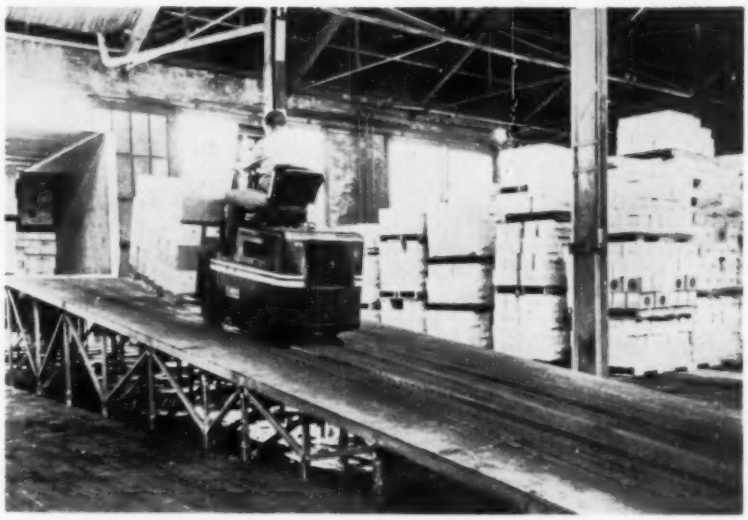
Does our approach do this? One of the finest compliments we received, sounded a little like the left-handed variety at first. An assistant factory superintendent commented that our program might not cut his company's insurance premiums too much, because inflation keeps moving prices up and insurance premiums were not his problem, anyway. However, he said, "The foremen out in the shop are getting a lot out of this. They are beginning to understand what this is all about and *how it can help them* get their job done and that's what counts with me."

That's also what counts with us. That's why we say, "The payoff is in *good* accident investigation." It not only finds the causes of accidents, it helps supervisors become *better* supervisors.

From an address presented at the 48th National Safety Congress.

A Salute to

A SAFETY IDEA



Abrasive Steel Gives Non-Slip Surface

A troublesome and costly shipping room problem at the Steel City Electric Company of Pittsburgh, Pa., was solved recently with the application of abrasive-surfaced, rolled steel flooring. Heavy fork-lift truck traffic between storage areas and loading docks was causing excessive wear to the floor and creating safety and maintenance problems.

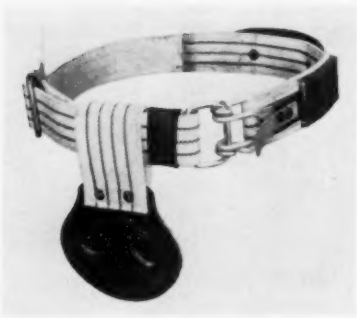
Confronted with this situation, Steel City Electric Co. ordered construction of four steel, inclined loading ramps. The abrasive rolled steel floor plate chosen to surface these ramps not only minimized the wear problem, but also provided a skid-free surface for the operation of the trucks, as shown in the picture. The decks of the trailers were also covered with the material to allow fork-lift trucks to drive directly onto them without fear of damage.

The use of the non-skid plate to solve this particular problem was suggested by two earlier applications in the same plant. The first was to protect the concrete floor between machines on the slitter line. Previously, the area had been subject to extreme abrasion from the flying ends of slit coils, and was chronically slippery from the over-flow of slushing oil used on the mill coils.

Another earlier application was for the protection of wooden floors which were being damaged by the concentration of weight on individual boards. The use of the steel plate in many aisles throughout the company's multi-story buildings distributed the weight of the trucks more evenly, and provided traction for both safety trucking and walking.

Picture by courtesy of Alan Wood Steel Co.

Another Injury Checked



Safety Belts, Safely Used, Saved Lives

Early this year two sheeters of the American Bridge Division of U. S. Steel Corporation were dangling on ropes 138 feet above a hot steam line.

It wasn't the safest place in the world. And, it wasn't the most comfortable position. But they were lucky to be there—just outside the west gable end of the semi-finishing building at the corporation's South (Chicago) Works.

Except for a rigidly enforced procedure in an extensive safety program, they would have fallen to almost certain death. The procedure, described in only a paragraph in the division's construction department safety manual, is:

"When working aloft, all men must tie off their safety lines except while getting from one point to another. This includes connectors working off scaffolds at large points. Do not fasten safety line over sharp edges. Wherever possible, tie up your safety line before getting on any type of scaffolding."

A vital assist was credited to safety belts the men were wearing, similar to the one shown in the picture. American Bridge has utilized equipment of this type since 1922. In fact, it was then that the idea of the safety belt is believed to have been born—when one probably saved the life of an employee working on the Michigan Central Railroad Arch over the gorge at Niagara Falls.

However, this is what happened, and how it happened in 1961 at South Works, according to American Bridge Division.

The sheeting gang—two sheeters and an apprentice—was working at a 142-foot elevation. Two pennant cables were hung over sides of the building so that 400-foot fall lines could be used on the sheeter scaffold. Safety streamer lines were hung over the side of the building to permit the men to tie off safety lines.

These were connected to a specially designed cotton web body pad belt on each of the men. This belt is made of special two-inch wide webbing and is fitted with a quick release buckle.

W. R. Borowski and M. Kozlowski were on the scaffold drilling holes and screwing down sheets while the apprentice, K. E. Musial, was handling the sheets—sorted, stacked and placed on floor plates at each floor during erection. Kozlowski was called off the scaffold for a short period, and the young apprentice stepped around the stack of sheets, tied his safety line to the streamer, and stepped onto the scaffold to help Borowski with the sheeting.

Shortly, the two proceeded to raise the scaffold 10 feet to continue their work. Lines were untied and the scaffold shifted. Because of the hot steam line below, fall lines were coiled at each end of the scaffold. It was because of this that the mishap occurred.

As Musial started to hook his line over the block, the excess fall line fell off the end of the scaffold. The line was jerked from his hands.

Borowski reacted immediately.

As the scaffold began dropping, he tied off his fall line and started toward the young apprentice. He almost made it—but didn't. One end of the scaffold fell from under the men, leaving them hanging from their safety belts and safety lines.

Commenting on the incident after the men were "fished" in, the American Bridge superintendent said safe procedure and equipment combined to "definitely save their lives."

Picture by courtesy of Mine Safety Appliances Co.

Britain's Safety Leader Visits U.S. and Canada

Britain's leading safety personality Leonard D. Hodge, took a close look at the safety scene in Canada and the "States" during a ten day tour in April. As National Director of the British Safety Council, he sought new ideas and techniques for spreading the safety message in factories, homes and on the roads.

Mr. Hodge attended the Industrial Accident Prevention Association's Annual Conference at Toronto's Royal York Hotel.

The next leg of his trip took him to New York to attend the Greater New York Safety Convention & Exposition at The Statler; and he also covered the industrial sessions of the National Society for the Prevention of Blindness Conference, returning to London to present his findings to British industrialists.

The independent, four-years old British Safety Council has as one of its main functions bringing pressure to bear on lethargic government departments to get them moving on matters of safety. The Council had a full-scale publicity campaign for car safety belts going eighteen months before the government took notice of this vital road safety aid. It was the British Safety Council that first urged inquiry into unsafe domestic oil heaters, months before official bodies took any action.

L. D. Hodge

On the industrial front, with over 6,500 member factories representing 3,500,000 workers, the British Safety Council does a major job of educating the British worker to become safety conscious.

THE FUTURE SHOWS

Los Angeles, Calif. *July 18–20*

Second Western Plant Maintenance and Engineering Show and Conference (Pan-Pacific Auditorium). Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

Poland Spring, Me. *Aug. 31–Sept. 1*

Thirty-Fourth Annual Maine State Safety Conference (Poland Spring House). Arthur F. Minchin, Secretary, Dept. of Labor & Industry, State House, Augusta, Me.

Greensboro, N. C. *September 12–14*

Third Annual Southeastern Plant Maintenance & Engineering Exposition (War Memorial Coliseum). John Harden Associates, P. O. Box 3173, Greensboro, N. C.

New York, N. Y. *September 25–28*

Second Industrial Building Exposition & Congress (Coliseum). Clapp & Poliak, Inc. 341 Madison Ave., New York 17, N. Y.

Philadelphia, Pa. *September 26–28*

Sixth Annual Sanitation Maintenance Show (Hotel Sheraton). Leonard S. Rogers, Manager, Sanitation Maintenance Shows, Inc., 310 Lexington Ave., New York 16, N. Y.

Chicago, Ill. *October 16–20*

Forty-Ninth Annual National Safety Congress & Exhibition (Headquarters at Conrad Hilton Hotel). R. L. Forney, Secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Washington, D. C. *March 6–8*

1962 Biennial President's Safety Conference on Occupational Safety. Bureau of Labor Standards, Dept. of Labor, Washington 25, D. C.

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(For details, use Key # G-5 on card on page 33)

Plastic Paint

(from page 15)

a 50-foot length of ½-inch inside diameter hose. Atomizing air at 35 to 40 p.s.i. was measured with a gage in the hose line just ahead of the gun and with the gun open.

An epoxy-urethane primer was sprayed on to a dry thickness of about 2 mils, then allowed to dry four hours. The first urethane top coat, a dark gray, was next sprayed on to a dry film thickness of about 3.5 mils and allowed to dry at least four hours. Then the second top coat, a light gray, was applied to the tank, dome, and dome platform. A black urethane was put on the under frame.

About 16 gallons of urethane paint were needed to coat each tank car, compared to 20 gallons for the conventional paints. Total urethane coating thickness on the tank cars averaged 5 to 6 mils. Maximum coverage obtained with the urethane paint was 750 square feet per gallon per mil.

The two-package urethane paint was made from urethane prepolymers. One component of the paint is a modifying resin and pigment; the other part contains solvent and the urethane prepolymer. When the two parts are mixed together prior to use, a chemical crosslinking reaction begins between the modifying resin and the prepolymer, and the paint cures as the solvent evaporates.

Picture by courtesy of National Aniline Div., Allied Chemical.

Air Pollution

A new OTS Selective Bibliography listing U. S. Government research reports, foreign translations, and other technical documents on the problems and effects of air pollution and methods and equipment for purification has been published by the Office of Technical Services, Business and Defense Services Administration, U. S. Department of Commerce, Washington 25, D. C. The bibliography, which may be purchased from OTS for 10 cents, is:

SB-448 **Air Pollution and Purification.** This bibliography lists 124 U. S. Government research reports and translations of foreign literature on air pollution by nonradioactive fumes, industrial gases, smokes, aerosols, and other contaminating agents. Articles from Communist China and the Soviet Union are included in the translations listing. Subject categories include problems and effects of air pollution; studies in levels of pollution; and methods and equipment for air purification.

Eye Protection Chart

The American Welding Society announces the publication of a chart giving the correct shades of glass to be used for proper eye protection in all welding and cutting operations. The simple design of the chart enables one to select immediately the shade of lens to use for a particular operation. On the left of the chart are the various soldering, brazing, cutting, and welding operations. On the right are listed the correct shade numbers to use for each process.

The operations are arranged in the order of increasing shade numbers. Soldering, therefore, with a relatively low light intensity, is listed first. The shade numbers increase as the light intensity increases until the highest shade number is reached when carbon-arc welding is used.

These "Lens Shade Selector Charts" are intended for display in all welding shops in order that maximum eyesight protection may be given by using the correct lens shade for each operation. Copies are available at 50¢ each, or 10 charts for $4.50, from the American Welding Society, Technical Dept., 33 West 39th Street, New York 18, N. Y.

Woman Driver's Handbook

Plenty of male drivers would learn a thing or two about their cars and about safe driving from this "Handbook for the Woman Driver" by Charlotte Montgomery, Automobile Editor of "Good Housekeeping." However, the guide is expressly written for the less mechanically inclined woman driver who may want to brush up on the what and why of cars and how to drive them safely. Originally published in 1955, it is now available in an up-dated, inexpensive paperback edition.

With helpful drawings and diagrams to illustrate the maneuvering of vehicles, the handbook presents the fundamentals of "wide-span" driving, the technique of planning ahead for situations that could develop on the road. It devotes chapters to concise explanations of: learning to drive, city driving and parking, night driving, car servicing, economical driving, winter care and winter driving, emergencies (such as frozen lock, no brakes, skidding, overheated engine, blowouts, horn keeps blowing, etc.), children in the car, touring, maps, teen-age drivers, buying a car, insurance, dogs, car rental, safety, etc., and for the feminine touch, clothes for motoring. It also includes charts showing where to get data from car manufacturers, driving requirements in the different states, and ten cardinal rules for safe driving.

Copies of the 239-page handbook can be obtained for 25¢ from: Phillips Petroleum Co., P. O. Box 35-A, Mt. Vernon 10, N. Y.

Scaffold Safety Rules

Recommended Safety Rules have recently been formulated and are being made available by the Steel Scaffolding and Shoring Institute, 2130 Keith Building, Cleveland 15, Ohio. Designed to promote safety in the use of steel scaffolding, they deal with some of the many practices and conditions encountered by contractors, sub-contractors and industrial plants in the use of steel scaffolding. Twelve of the rules are applicable to fixed scaffolding and cover subjects such as the proper use of sills at the base of the scaffold and the use of guard rails at the top. In addition, the Institute lists eight safety rules applicable in the erection and use of rolling scaffolds. Free copies may be obtained by writing to the Institute.

The Steel Scaffolding and Shoring Institute was incorporated in 1960 with the basic objectives in connection with products of the Industry of promoting the general public welfare and safety, developing engineering criteria, developing recommended standard testing procedures, disseminating information as to proper use, and promoting the widespread use of the product.

industrial hygiene

Edited By
MARK M. LUCKENS, M.S., F.A.I.C.
Industrial Toxicologist and Hygienist

Author of
"Manual of Industrial Hygiene and Toxicology"
"Manual of Methods of Air Pollution Control"
"Monographs of Industrial Hygiene"

Member of
American Industrial Hygiene Association, N. Y.
Fellow American Institute of Chemists
American Chemical Society
American Academy of Forensic Sciences (Toxicology Section)

Benzene In Rubber Solvents

The safety engineer and industrial hygienist are well aware of the highly toxic nature of benzene. As is well known, this solvent is one of the most dangerous in common industrial use. Of late, there have been reports, confirmed by laboratory analyses, of rubber solvents containing two to nine percent of benzene being sold on the open market. The lower concentration is sufficient to provide a level exceeding the threshold limit value for an eight hour exposure to this compound. Forewarned is forearmed. Check your labels, check your vendors, check your solvents.

Nylon Dermatitis

Allergic reactions to nylon have been reported. The reaction has been stated as being due to the dye, the finish or the virgin fibre. In view of the extensive use of this material in industry and the home, the safety engineer should be aware of the possibility of untoward reactions as a result of contact with nylon. Occupational cases have been reported.

M A C's

Maximum allowable concentrations, or Threshold Limit Values, as they have been called for the past few years are but bench marks. They do not represent safe limits for toxic substances which can be endured by all people for an eight hour day. They are not maximum safe limits, rather they are educated "guesstimates" based on experience and animal studies. Since people and environmental conditions vary, the safety engineer should not rely on these data alone in his evaluation of an industrial exposure. Design criteria should be set to provide atmospheres containing as low a level of the contaminant as is economically feasible, rather than simply to meet the threshold limit value without regard to the particular environment or the economics of the situation. Use the MAC as something to work "from" not "to."

Chronic Carbon Monoxide Poisoning

The possibility of chronic carbon monoxide poisoning is a real one and should be so recognized by the industrial physician, hygienist, or safety engineer. Carbon monoxide is produced whenever there is incomplete combustion of carbonaceous matter. This may occur at the soot covered baffle of a gas pilot light, in a gas fired hot water heater, or in an industrial process where the supply of air is limited.

Because of its strong affinity for the hemoglobin of the blood, carbon monoxide exhibits some of the characteristics of a cumulative poison. The carbon monoxide-hemoglobin complex (the culprit in carbon monoxide poisoning) may persist for as long as two to three days after the termination of an exposure. Thus it can be seen that, under conditions of continual exposure to low levels of this toxicant, it is quite possible to build up an accumulation of the toxic complex. The effect of such a situation may go far beyond merely reducing the oxygen transport capacity of the blood. There is evidence that carbon monoxide has cytotoxic properties, in addition to its well known anoxic effect. Experimental animals exposed daily, for periods of several hours, to low con-

centrations of this gas show degeneration of the heart muscle and certain areas of the central nervous system. Often a secondary polycythemia also develops.

When individuals are exposed, daily, to low concentrations of carbon monoxide, they eventually show the effects of the insidious accumulation of this compound. Their symptoms consist of loss of appetite, dizziness, nausea, a constant dull headache and memory defects including the inability to recall recent events. Anemia and erratic behavior patterns have been shown to develop when as little as four percent of the saturation capacity of the blood has been preempted by this gas. Repeated exposure to concentrations as low as 0.01% of carbon monoxide for several hours per day can produce chronic ill health. The changes produced in the brain, under these circumstances, can be seen clinically and have been reproduced in experimental animals.

It would be prudent then to check all combustion processes in the plant as well as in all areas where internal combustion engines are operated, with a view to reducing carbon monoxide production to a minimum and making provision for adequate ventilation.

Personnel working in such areas should undergo periodic physical examinations which include the determination of the carbon monoxide saturation level of their blood. They should be watched to see whether they exhibit any of the symptoms associated with chronic carbon monoxide poisoning. The level of carbon monoxide in the blood may be determined quickly and simply in the average laboratory. The presence or absence of the carbon monoxide-hemoglobin complex in the blood is conclusive evidence of the degree of exposure.

Tranquilizers and Sedatives

The widespread use of tranquilizers, sedatives, and sleeping preparations poses some interesting questions in industrial safety. It is well known that those medications affect the central nervous system, behavioral patterns, response to stimuli, etc. How, if at all, has the use of such materials affected accident rates in industry?

Canister Gas Masks

Gas masks are not designed for use under all conditions. It must be remembered that they do not supply air. They are simply filtering and adsorbent devices. In general, their use is limited to atmospheres containing 2% or less of certain harmful gases. It must be remembered that they are limited in their adsorbing capacity, in the gases they can handle, in the concentration of toxicants they can handle. Under no circumstances should they be used as substitutes for good engineering practice in the control of toxic atmospheres. Last but not least, they should be frequently inspected, changed when necessary, and kept near their place of use.

Cadmium Hazard In Silver Solders

Noticed any yellow deposits on your silver soldered work? Cadmium has been found to be a constituent of quite a few commonly used silver solders. Where acetylene flames are used, this presents a real hazard. The heat of the flame liberates a cadmium oxide fume. If you use silver solder and use acetylene torches, watch for yellow residues. . . . The yellow indicates your man has been exposed to toxic cadmium oxide fumes.

Alcohol

Studies have shown that drivers who drink are involved in more accidents that those who are sober. Results of one study indicate that a driver under the influence of alcohol is some ten times as likely to have an accident than one who is not. Just as in driving, alcohol affects any activity which requires judgment, coordination, self control, and quick reaction time. Drinking on the job as well as drinking while driving are important safety problems. Alcoholism or even social drinking are medical and management problems which require even more research than is at present being done. A review of the physiology, pharmacology, and toxicology of alcohol in industry and driving will appear in these columns, in the near future.

Toxicity Data Service

A consulting organization will provide toxicity reports on products, processes, or individual compounds on a fee basis or subscription.

Continuous Pouring

Brass foundries considering going over to continuous pouring should consider the possible lead hazard involved. Since brasses contain two to five percent lead, the continuous handling of the molten metal presents a hazard. Under ordinary working conditions, without proper ventilation control, these brasses will create levels of lead in the atmosphere exceeding the threshold limit value. Another example of an industrial material which contains relatively little of a toxic substance, but which under certain circumstances may present a real health hazard.

Queries

Questions, of general interest, will be answered in this column from time to time. So send your questions along. Sorry, but it will not be possible to make individual replies or give specific information which might be construed as the evaluation of a writer's individual problem.

TRIPLE CHECK AIR TEST ✓✓✓

A hand-operated CO indicator is employed to check for possible monoxide concentrations at widely scattered locations.

A technician uses a colorimetric CO "Squeeze bulb" tester to measure carbon monoxide concentration at rear of a gasoline powered fork lift truck.

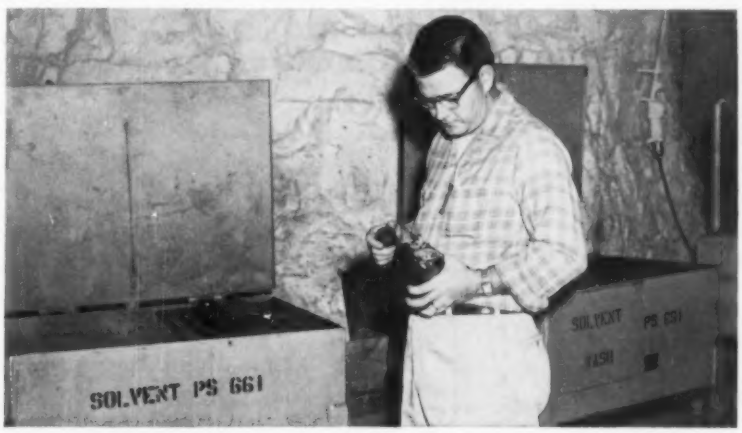
A triple-check system of prevention and control has practically eliminated the danger of air contamination in operation of the world's largest storage cave—the Atchison (Kans.) Army Ordnance Storage Facility.

U. S. Army machine tools, valued in millions of dollars, are stored and rebuilt in this area which covers 65 acres. Here too, 150 employees—many of whom are often thousands of feet from "open air"—are protected from the possibility of contaminated air. Safety measures include a high volume ventilation system, exhaust purifiers on gasoline-powered material handling equipment, and—as an additional safeguard—portable indicators that guard against carbon monoxide concentrations. Other instrumentation is available to register any possible build-up in combustible vapors.

Machine tools are shipped to the storage facility by truck, rail, and barge. Tools are moved in and out of the cave by 10 gasoline-powered, 7½-ton fork lift trucks. In addition, inside the cave, two gasoline-powered sweepers are used for maintenance.

The ventilation system, capable of completely changing air in the cave once every three hours, has proved adequate—even with increasing materials handling activity. However, to ease the load on this system, Page Airways Inc., which operates the cave, decided to use exhaust purifiers on all material handling equipment. This alone eliminated up to 95 percent of air contaminants, and kept carbon monoxide content below 100 parts per million of air.

(Continued on page 38)



The possibility of combustible vapors is checked with the explosimeter twice a day in this small parts area.

WHY NOISE CONTROL?

Written and Directed by William F. Glaser

A PLAY IN TWO ACTS

With Alternate
Act II
to allow the Audience
to Select Either
a Tragic or
They-All-Lived-Happily-
Ever-After
Ending

CAST

MR. DUNN: Vice President of Manufacturing, Center City Metals, Inc.
MISS GRAHAM: his secretary
BILL PICKETT: Company Safety Engineer

TIME: the present
SCENE: Mr. Dunn's Office

Settings by H. H. Scott, Inc.

ACT I

(As curtain rises)
Mr. Dunn is seated at his desk as Miss Graham opens the door from the general office (53 db noise level) and brings in the morning mail.
Mr. Dunn: (gruff voice—65 db) What's this? Oh yes—the legislative report of the State Manufacturers' Association. (mumbling—48 db) I wish those people would do something about the labor and business tax laws in this State—getting harder and harder to make a fair profit.
Miss Graham: (agreeing—50 db) Yes, Mr. Dunn.
Mr. Dunn: By the way, Miss Graham, please ask Mr. Jones if next year's sales forecast is ready yet.
Miss Graham: Yes, Mr. Dunn. (turns to leave)
Mr. Dunn (concerned—68 db) Wait! Look at this! (reads aloud)

> SOLONS ALLOW COMP. FOR HEARING LOSS
> *Principally Affects Metal Industries:* Over the protest of the Manufacturers' Association at this further liberalization of Workmen's Compensation, the State Legislature last week approved compensation payments for both partial and total hearing losses. Estimates of cost to State employers ranged from one to five million dollars a year. . . .

Never mind Mr. Jones' sales forecast. Tell Bill Pickett I want to see him right away!
Miss Graham: (Caught up in the excitement, but not quite understanding it all—63 db) Right away, Mr. Dunn!

(curtain falls, end Act I)

Act II

Time: A few minutes later. Place: Mr. Dunn's office. As curtain rises, Mr. Dunn is striding back and forth

in front of his desk, alternately reading the news article and reflecting on its meaning to his company and to himself. Bill Pickett enters.
Mr. Dunn: (still concerned—69 db) Come in, Bill. Have a seat. Have you heard about this hearing loss compensation business?
Bill Pickett: (somewhat bewildered by Dunn's ob-

vious concern) Compensation? Hearing loss? (almost to himself) So they passed the amendment?

Mr. Dunn: And how, it passed! It says here that compensation claims for hearing loss may range up to $5,000,000 a year, and that can mean quite a chunk here too! But what I want to know is what have we done to avoid the problem. Where do we stand?

Bill Pickett: (recovering, and covering—63 db) Mr. Dunn, I don't think we have anything to worry about.

Mr. Dunn: (really worried now—74 db) Think!? But what have we *done* about it. Is anybody out in our plant losing their hearing?

Bill Pickett: I don't think so. About a year ago, I went around and talked to almost all of our foremen, and none of them thought we had any problems with noise.

Mr. Dunn: (uncontrolled—74 db) Think!? Talked!? Let me read you something (reads) "Experts estimate that the brunt of paid claims will fall on metalworking companies who have not instituted a formal noise control program." Is that us, Mr. Pickett?

Bill Pickett: (unhappily) I guess so, Mr. Dunn.

(Curtain falls—end)

Alternate Act II

Time, place and setting the same. Bill Pickett enters.

Mr. Dunn: (still concerned—69 db) Come in, Bill. Have a seat. Have you heard about this hearing loss compensation business?

Bill Pickett: (confident—61 db) So they finally passed the amendment. Well it was only a matter of time. To tell the truth, I half expected it to get through last year's session.

Mr. Dunn: (struck by Bill Pickett's confidence—65 db) What do you mean? You almost sound glad! This could be very serious. You know how small our profit margin has been the past few years. If our workmen's compensation costs go up . . .

Bill Pickett: To tell the truth, Mr. Dunn, I think I am glad! (Dunn is shocked) Now let me finish (laughing). Three years ago a safety engineer from our insurance company took an inspection tour of our plant. He was very pleased to see the emphasis we had placed on safety—machine guards, safety glasses and shoes, posters, and so on—but he was disturbed about the noise in the shop areas. I asked him for more information.

Mr. Dunn: (starting to be relieved, and caught up in the narrative—62 db) Yes, what happened?

Bill Pickett: He brought back the information, and suggested some additional sources. I then started digging. It took me almost a year to get things going. In fact, one of the biggest stumbling blocks was getting *you* to approve my requisition for about a thousand dollars worth of equipment!

Mr. Dunn: (immensely pleased) Nosiree, no "yes" men in *this* organization.

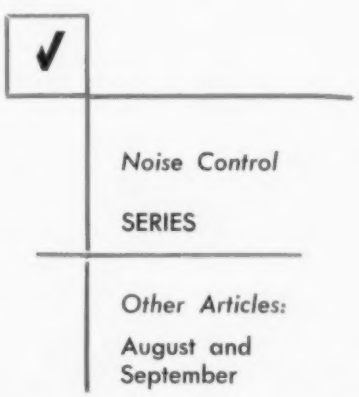
Bill Pickett: (amused when he recalls the knockdown, drag-out fight he had to get the requisition approved) To make a long story short, we got the neces-

sary equipment and set about the job of finding, diagnosing, and curing all of our trouble spots. Now let me tell you why I'm *glad* we instituted a noise control program.

Mr. Dunn: (still dubious) I don't know if I'd be glad about all this.

Bill Pickett: There are really three aspects to a noise control program. First of course, we are concerned with our people's hearing just as we are interested in their sight. Morale is improved as our employees realize we are interested in them, and, incidentally, we avoid the possibility of hearing loss compensation claims. Second, it's important from an overall safety point-of-view to have a relatively quiet shop so that instructions can be understood, warning shouts heard, etc.

Last, we seem to have experienced an increase in efficiency in most of the production areas where noise



control procedures were instituted. People apparently enjoy working more in a quieter environment and hence seem to work better. Absenteeism has gone down too!

So now you can see why I say I'm glad that we instituted this noise control program a few years ago. *Mr. Dunn:* Sounds good to me. But I'll bet there are a lot of companies in this state that aren't as well off as *we* are. . . . Say, would you like to give a talk on this noise control business at the next meeting of my manufacturers' luncheon club?

(*as curtain falls, Mr. Dunn places his arm on Bill Pickett's shoulder and beams happily—end*)

True story? No, but generally quite possible, and even probable considering the trend of compensation legislation.

Far-fetched? Sure! No safety engineer could successfully undertake a noise control program without the wholehearted cooperation of both management and supervision. But the problems posed are *not* far-fetched. And the benefits of a good noise control program are, if anything, understated by Bill Pickett.

Still not convinced? Consider these items published within the last few months:

> "Compensation payments for deafness acquired on the job today run to an estimated $2 million a year."
>
> —*Top Management Newsletter*
>
> "Rhode Island to reconsider proposal making deafness due to a noisy work environment compensable."
>
> —*Safety Magazine*
>
> "Noise costs U. S. industry an estimated $2,000,000 a day in compensation, lost man-hours and decreased efficiency."
>
> —*National Weekly News Magazine*

As Bill Pickett pointed out, there are three main objectives to a noise control program—prevention of hearing loss, over-all safety, and improvement in worker efficiency.

Prevention of Hearing Loss

The adoption of safe working practices has proved to be not only socially desirable, but good business as well. It would be difficult, if not impossible to find a plant in this country where there isn't a safety poster, where there is no eye safety program—in short, where management has not recognized and encouraged a safety program. "Safety first" is as familiar to us as our own names.

But, although we worship at the shrine of safety, the hazard of uncontrolled noise is not so widely recognized—in fact noise may be described as the last frontier of safety.

Of course, this is not true everywhere. Only three states, Wisconsin, New York and Missouri—have legislation dealing with noise induced hearing loss. Management in *these* States has been very much concerned with noise—witness the numerous Industrial Noise Conferences sponsored by the Associated Industries of New York State! The Federal Government, under the Longshoremen and Harbour Workers Act, covers maritime workers. In the absence of specific legislation, claims have been paid in *44* out of the 50 states for partial loss of hearing due to noise, although claims filed have not "snowballed" due to a fortunate lack of extensive publicity! Legal experts, leading safety engineers, otolaryngologists and employers are increasingly concerned over the noise problem and its potential cost to industry!

Noise is as insidious a danger as radiation: Too large a dose of radiation at one time can kill or maim; prolonged exposure to radiation above safe levels can also permanently harm. Substitute the word "noise" for "radiation" in those two sentences and you still have true statements!

It has been estimated that about 18,000,000 people in our country suffer from some degree of hearing loss. Accurate estimates of the number who have suffered this hearing loss due to noisy work environments are virtually impossible to make, but certainly the total must run up into the millions! This, then, is the potential compensation caseload should hearing loss be universally compensable!

Over-all Safety

> "Joe, watch out for that crane!"
> "Joe, ROAR-HISS-CLATTER!"

Which statement would cause you to duck?

> "Linda, to operate the machine you feed it, then press this button. At the same time put the plexiglas guard down. Understand?"
>
> "Linda, to CLATTER the machine HISS-S it, then CLATTER ROAR same time SCRAPE guard ROAR. Understand?"

Which instruction would be understood? In the event that it isn't, would a brand new employee be likely to question her supervisor?

The answer is obvious. Too much noise, or intermittent, masking type noise, can destroy voice communication and thus create safety hazards of every sort.

Also, experienced operators can often tell by the *sound* of a machine when something is wrong, just as the open hearth superintendent can tell by the *sight* of a melt when to pour out the molten steel. If the operator cannot *hear* the machine, he cannot stop trouble (e.g. costly breakdown; flying metal parts, chips, or splinters) before it starts.

Thus, an accident really *caused by noise* may appear in the books as "failure to follow instructions," "machine failure," etc.

Efficiency

Efficiency is quite the magic word in industry today and it's probably fair to say that many sins are committed in the name of efficiency. There is no intention to add to the sin list here.

But how many times have you gone home on a rainy day to find the dinner not made and your wife practically in tears—"Those children ran around and screamed all day. I just can't take it any longer!" Certainly we can notice the same type of stress reaction to noise in industry.

(Continued on page 37)

LOSS STOPPERS

The free bulletins and catalogs reviewed below are offered by the Reader Service Department of this publication. To obtain copies without cost or obligation, write in the key numbers on the Reader's Inquiry Card.

MISCELLANEOUS

Training Film Recorder-Projector 277
International Film Bureau, Inc. Helpful folder shows how you can make your own sound slidefilms for safety training programs. Technique utilizes an automatic device that tape-records spoken commentary and reproduces it with its own slidefilm projector.

Indicating Limit Switch 278
MICRO SWITCH. This data sheet outlines the features of a limit switch with a built-in indicating lamp that tells whether or not the circuit is being controlled.

Ladder Safety Device 279
Safety Tower Ladder Co. Illustrated 6-page bulletin gives complete details on a safety device to prevent falls on permanent vertical ladders. Equipment includes a safety belt attached to a sliding sleeve on carrier rail. It automatically locks in position to prevent motion in the down direction.

Air Supply Lock-Out Valves 280
Hunt Valve Co. Unique safety device to lock-out air supply lines, shut off the air and exhaust the air pressure during repair and maintenance operations on machines is described in this illustrated bulletin. Includes diagrams of how the valves operate.

Awards & Advertising Specialties 281
Marvic Advertising Corp. Illustrated catalog-compendium shows over 500 sales specialties and promotion items, with and without company name, suitable for contest prizes, advertising "gimmicks" and incentive awards.

INDUSTRIAL HYGIENE

Air Pollution Control 282
John Wood Co., Air Pollution Control Div. This 20-page brief discusses the high-level problem of air pollution and how it can be handled most effectively. It calls for a coordination of abatement activities at the national government level, with control maintained at the local level.

Pneumatic Muffler 283
Allied Witan Co. Brochure describes a muffler to absorb the noise of pneumatic, steam and vacuum equipment, shows in cut-away drawings how the units work, and illustrates various models and typical applications.

Carbon Monoxide Test Kit 284
Mine Safety Appliances Co. A CO test kit to determine by two methods the percentage of carbon monoxide poisoning is described in this bulletin. It explains how the equipment can be used either for testing CO in exhaled air sample or in blood sample.

PERSONAL PROTECTION

Plastic Goggle Catalog 285
Watchmaker Optical Co. This well-illustrated and informative catalog presents a full line of plastic safety goggles and spectacles, face shields, and a respirator for nuisance dusts and paint spray. Includes eye protectors for impact, dust, chemical splash, glare, welding hazards, etc.

Comfortable Welder's Headgear . 286
Fibre-Metal Products Co. Four-page bulletin describes welding helmets with a smoothly-conformable plastic headgear with headsize and crown adjustments. Also shows optional equipment such as sweatbands, face shields, supplied air connection, inner bibs.

Dust Masks & Industrial Equipment . 287
Martindale Electric Co. This 64-page catalog pictures and describes the latest safety, maintenance and production equipment, such as dust masks, test instruments, motor maintenance devices, saws, rotary files, etc. This source book has dimensional drawings and how-to-use photos.

FIRE PROTECTION

High-Pressure Fog 288
John Bean Co. 24 questions about fighting fires with high-pressure fog are answered in this booklet on controlling industrial fires. Includes data on fire trucks and stationary units utilizing this type of fog equipment.

Extinguishing Agent for Metal Fires 289
Callery Chemical Co. Among the properties and uses of trimethoxyboroxine, described in this 12-page bulletin, are the chemical's ability to extinguish metal fires. Case histories are given on fires involving zirconium sponge, magnesium chips, titanium sponge, magnesium castings.

Fire Tanker Truck 290
Baughman Mfg. Co. A new water-tank type of fire truck is described in this bulletin which explains how water can be pumped from its 1500 gallon supply even while truck is in motion.

(Continued on the next page)

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Loss Stoppers (Cont'd)

PLANT MAINTENANCE

Laminated Safety Glass 291
Monsanto Chemical Co.'s Plastics Div. Bulletin describes industrial situations where laminated architectural glass would help prevent injuries and fatalities caused by flying glass, since this type of safety glass withstands low pressure shocks or particles and minimizes flying glass when broken.

Commercial Floor Maintenance Guide 292
Armstrong Cork Co. A 24-page, informative guide for maintenance personnel in the care of commercial and institutional floors. Includes outline of common problems and how to handle them, daily maintenance procedures, selection of equipment, stain removal from different floorings, and data on waxes, finishes and cleaners.

Stair Non-Slip Resurfacer 293
Robert N. Kimball & Sons, Inc. This bulletin describes an abrasive resurfacing material to make stairs level and non-slip. Diagrams show how material can be used as strips and nosings, or for full or partial coverage on stairs of stone, metal, wood, concrete.

Industrial Weed & Brush Control 294
Du Pont Industrial & Biochemicals Dept. A 12-page handbook for analyzing vegetation problems and selecting the right chemical or chemical combination according to plant species, rainfall, soil, and economic factors.

Dehumidifying Compound 295
Speco, Inc. Bulletin describes a moisture absorbing compound to prevent rust and mildew in damp areas. Includes chart showing how effectiveness of compound increases as relative humidity rises.

Non-Slip Gratings 296
Bustin Steel Products, Inc. New 32-page catalog presents a full and varied line of non-slip serrated-edge gratings and treads. Includes numerous walkway products utilizing the gratings, such as machine and work platforms, steps, stair stands, ramps, etc.

What's Your Problem?

- **Has an accident or fire interrupted production?**
- **Want to know how to prevent it?**
- **Do you need background information on equipment for industrial safety, hygiene, or maintenance?**

As a service to its readers, this publication will arrange to supply manufacturers' literature on the following subjects. Just insert the key number on the Readers Inquiry Card on the preceding page and be sure to fill in your name and address. If you need information on a specific type of product, simply write it in on the Inquiry Card.

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101	Safety Goggles
102	Face Shields
103	Lens Cleaning & Anti-Fogging Equipment
104	Sweat Band
105	Hard Hats
106	Respirators & Masks
107	Protective Clothing
109	Safety Belts
110	Safety Gloves
111	Electrical Gloves Tester
114	Welding Helmets
115	Fire Fighting Suits
117	Safety Shoes
	FIRST AID AND HYGIENE
120	Protective Skin Creams
122	Sanitary Drinking Facilities
124	Salt Tablets
125	Resuscitators
126	Antiseptic Medication
127	Burn Medication
127A	Poison Ivy Immunizer
127B	Poison Ivy Medication
128	First Aid Kits & Supplies
129	Stretchers & Litters
129A	Stretcher Cases
130	Throat Medication
131	Eye Wash Fountains
131A	Emergency Showers
132	Portable Ventilators
133	Dust Collectors
135	Hearing Protectors
137	Noise Mufflers (machines)
	FIRE PROTECTION
141	Safety Cans
142	Fire Alarms
148	Watchmen's Control System
149	Fire Blankets

Key Number	Subject
	LIGHTING AND WARNING DEVICES
150	Alarms & Warning Lights
153	Fluorescent Lamp Guards
154	Emergency Lights
155	Truck Back-Up Alarms
	MAINTENANCE
161	Anti-Slip Waxes & Finishes
162	Floor Cleaning Compounds
163	Floor Cleaning Machines
164	Floor Resurfacing Compounds
165	Oil Absorbents
168	Ultrasonic Flaw-Detector
	LADDERS & HANDLING
170	Ladders
171	Ladder Safety Devices
172	Scaffolds
173	Work Platforms
174	Emergency Ladder Rungs
175	Safety Hooks
176	Folding Truck Steps
177	Carboy Pumps
	GUARDS
178	Machine Guards
179	Power Press Feeders
180	Safety Tools
181	Vacuum Sheet Lifters
182	Valve Operators
184	Safety Lock-Outs
185	Lock-Out Air Valves
	EDUCATIONAL AIDS
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193	Employee Safety Guide
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NOISE CONTROL

(from page 32)

One company reduced office noise levels by 14.5% by installing acoustic wallboard. Possible cause-and-effect result—typists' errors fell 29%, machine operators' errors decreased 52%, employee turnover declined 47%, and absenteeism decreased 37.5%.

A highly scientific and rigidly controlled test of human reaction to a noisy environment is being conducted at Shaker High School near Albany, New York. Carpeting, as acoustical treatment, has been applied to about half of the classrooms and hallways. Early in the study, the psychological effects on the pupils became of paramount interest to the investigators. School administrators report that when students walk from an uncarpeted area to a carpeted area, they become "ladies and gentlemen." Boisterous conduct and speech stop, and hats are removed. Teachers report an improved relationship between teacher and pupil.

It would seem there is a significant weight of evidence that noise does in fact affect people psychologically, and thus would affect a person's work.

The Positive Approach

Sad, but true, managements all too often defer or avoid taking action in vital areas until forced to do so by legislation or labor unions. Noise control is one such area of neglect in many companies. Workmen's compensation legislation *is* forcing the issue in several states, and it seems only logical that similar legislation will soon be passed in many other states.

Talk of compensation is, of course, a rather negative approach to the problem. More exciting are the positive objectives of avoidance of hearing loss, higher morale, increased safety, improved efficiency and lower absenteeism and turnover.

Best of all, it costs little in terms of time or money to discover whether or not a problem exists. An initial noise survey can be accomplished after 3 to 5 hours' worth of study of noise measurement principles. A modern transistorized sound meter for survey measurements is available for as little as $150. If a problem is then found to exist additional expenditures of time and money would be required, and would be directly proportional to the seriousness of the problem.

Ed. Note: A free copy of the H. H. Scott, Inc., booklet, "Noise Simplified" discussing the A, B, C's of noise measurements is available on request.

Toluidine Data Sheet

Chemical Safety Data Sheet SD-82, listing the properties and essential information for safe handling and use of Toluidine, is now available from the Manufacturing Chemists' Association, Inc., 1825 Connecticut Ave., N. W., Washington 9, D. C.

The data sheet discusses the properties, hazards, engineering control of hazards, employee safety precautions, fire fighting procedures, safe handling and storage practices, tank and equipment cleaning and repairs, waste disposal, medical management and first aid.

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Rocket Propellant Safety

In an effort to make available to the military services and applicable government agencies and their contractors technical information on the safety aspects of manufacture, handling, storage and transportation of rocket propellants, the Manufacturing Chemists' Association, Inc. has organized a chemical propellant safety subcommittee, the Association announced.

The technical group, which will operate under the guidance and direction of the Association's General Safety committee is composed of representatives of a dozen chemical propellant manufacturers.

Chairman of the technical subcommittee is Ralph Bloom, Jr. of Food Machinery and Chemical Corp. and vice chairman is James G. Chalfant of Olin Mathieson Chemical Corp.

The rocket propellant safety group also expects to publish safety data sheets, when such sheets appear to be necessary, and to assist the military services and others in establishing uniform standards of safety.

In a recent letter to Secretary of Defense McNamara informing him of the formation of the committee, General John E. Hull, MCA president, emphasized that MCA through its general safety committee "has for a long time made studies of safe practices in the storing and handling of chemicals and has made available the results of these studies to the chemical manufacturing and using industries. Through these MCA efforts accepted procedures have been established for a wide variety of chemicals."

Recognizing the limitation of individual representation, the Association formed the subcommittee, General Hull said, to assemble and more effectively disseminate results of their industrial experience. It is expected that non-petroleum liquid propellants would receive early attention by the group.

The Association also pointed out that the safety subcommittee should be available to assist any other industry or government agencies in preparation or revision of existing safety manuals or guides.

School Bus First Aid Standard

A study made recently by the Industrial Safety Equipment Association revealed a startling lack of provision for first aid equipment in the nation's school buses. I.S.E.A. President Jack Monohan called on members of the Association's Unit First Aid Group to work for a nation-wide set of standards.

Mr. Monohan termed school bus first aid requirements of some states "inadequate" and urged action on the part of interested safety organizations. Currently working on programs for the improvement of school bus first aid are the National Congress of Parents and Teachers, and the Veterans of Safety. The latter group has labeled their project "Save Our Most Precious Cargo."

The I.S.E.A. study, which covered 48 states over a six-day period, revealed 24 individual accidents—an average of four per day—involving 294 students. Casualties requiring first aid among students numbered 40.

Of the states studied, five actually do not require school buses to carry *any type* of first aid kit. Seven states require first aid in their school buses but make no specifications as to size, contents or usage. Eleven states specify size of kit, but list no requirements or methods. First aid training for the bus driver is at the option of the local school district.

Among the safety measures proposed by Mr. Monohan were a mandatory first aid education program for school bus drivers, and a nation-wide standard of first aid specification for all school buses.

For additional information on activities to improve school bus first aid standards, write to: Mr. V. P. Gopcevic, Secretary-Treasurer, Industrial Safety Equipment Association, Inc., 420 Lexington Avenue, New York 17, N. Y.

Industrial Hygienist Certification

The American Board of Industrial Hygiene invites inquiries from those who are interested in applying for voluntary certification in the profession of industrial hygiene. Certificates will be issued on the basis of an examination to those who have had eight years of practice, following a suitable baccalaureate degree. No examination will be required of those who have had fifteen years of practice with recognized contributions to the field, following acceptable education. Certain specialists within the field will be certified when one-fourth of their time has consistently been devoted to application of their specialty to industrial hygiene. A brochure describing the certification program, and giving more details of eligibility will be sent to those who direct inquiries to Henry F. Smyth, Jr., Secretary-Treasurer, American Board of Industrial Hygiene, 4400 Fifth Avenue, Pittsburgh 13, Pennsylvania.

TRIPLE CHECK AIR TEST

(from page 29)

Even then, to be completely safe, officials assigned a full-time employee to check possible carbon monoxide and combustible vapor concentrations, temperature, and humidity.

For example, the purified exhaust of each lift truck and sweeper is checked once every 30 days with a colorimetric carbon monoxide "squeeze-bulb" detector. This tester, draws an air sample through a sensitive detector tube which measures carbon monoxide concentration of exhaust leaving the purifiers. The purifiers have an average life of approximately 3,000 hours.

In addition, this technician uses a crank-type indicator to check for possible carbon monoxide concentration at 16 widely scattered cave locations during operating hours. The hand-operated indicator does not require storage batteries or electrical circuits. It sucks an air sample mechanically and is capable of a CO reading ranging from .0 to .15 percent.

In the area where small parts are cleaned prior to storage, the same technician uses an explosion meter to check for combustible vapors twice a day. The same unit is also employed in open sections of the cave or where officials believe there is the least possibility of explosive vapors.

Pictures by courtesy of Mine Safety Appliances Co.

Edited by HENRY M. GROSMAN
Counselor at Law, Newark, N. J.

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Compensation, New Jersey Bar Association
National Federation Insurance Counsel
Past Commander, American Legion, Post 10,
. . . . . Newark, N. J.

KNEE INJURY—Physical Therapy as Causing Blood Clot—Causal Connection—Burden of Proof

A carpenter suffered an injury to his knee which the employer accepted as compensable. The employer paid temporary total disability compensation and medical benefits, which included two operations and orthopedic care. During the course of recovery, the employee underwent three months of physiotherapy which consisted of the insertion of electric needles into his legs. This treatment caused violent involuntary physical motion and muscle spasms, leaving the patient completely exhausted. One day, after reporting for his regular treatment, the carpenter noticed a tingling sensation which increased until his right arm and leg became numb and his speech slurred. A neurosurgeon diagnosed the condition as a blood clot in the brain and testified that a period of stress, such as that produced by the physical therapy, could well precipitate the formation of a clot in a susceptible person. The employer refused further medical treatment as a result of the cerebral accident. The deputy commissioner found the condition to be compensable and ordered the employer to pay compensation and medical benefits. In reversing the order, the full commission maintained that the medical testimony in support of the cerebral accident did not meet the test of reasonable medical certainty. On appeal, the court held the position that workmen's compensation cases are concerned only with the rule that, where the fact of a serious accident is conclusively shown and a logical cause for it is proven, those who seek to defeat recovery for the injury have the burden of overcoming the established proof and of showing another cause of the injury more logical and consonant with reason. Order of the deputy commissioner reinstated.

Ortkiese vs. Clarson & Ewell Engineering; Florida Supreme Court, No. 30,687, January 18th, 1961.

GOING TO AND FROM WORK—Transportation Supplied by Employer—Alleged Deviation From Homeward Route

An employer operated a cleaning establishment on a military reservation where ordinary transportation was limited. It was his practice to allow some of the employees to use his trucks in going to and from work and to take home other employees who lived along the way. Concededly then, an accident oc-

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curring during such time would be considered as having arisen out of and in the course of employment. On the day of the accident in question, however, the claimants, the driver of the truck and another employee whom he was transporting home with the employer's permission, picked up a third employee who had missed his bus, and offered to drive him to his home which was located four miles in an opposite direction of the driver's normal route. On the way, the men stopped and bought a pint of whiskey and the two passengers consumed it in the truck outside the liquor store. Subsequently, the accident occurred, and the lower court denied compensation to the claimants on the ground that they had deviated from the scope of their authorized activity in volunteering to take the third employee to his home. On appeal, the decision was reversed. It was ruled that the deviation was not material because it only involved a few extra miles of highway driving, as compared with the 18 mile journey homeward, and because the claimants were acting for the employer's benefit in giving the third employee a ride home. The drinking episode which lasted about 45 minutes was also ruled not to be a material deviation. Reversed and remanded.

Green vs. Bell Cleaners; New Jersey Superior Court, Appellate Division. No. A-993-59, January 24th, 1961.

BACK INJURY—Allegedly Resulting From Fall

This case was appealed by the defendant employer following a denial of an application for rehearing. The judgment of the trial court had been in favor of the employee. The employee, a potato trimmer in a firm which processed and packaged frozen foods, alleged she suffered considerable back injury when she slipped on some grease while carrying out her duties. The plant superintendent testified that the only accident happening to the employee was a fall occurring when she went for a drink of water. At the time of the fall the employee maintained she was not hurt. At no time during the course of her employment with the firm did she complain of an injury. Her whole testimony was filled with inconsistencies. In view of these inconsistencies, the higher court held that any back injury she may have at present is in no way related to the fall and that she tried to use this fall in an attempt to gain compensation for an injury sustained outside of her employment. Judgment of the trial court reversed.

Owens vs. Arkansas Frozen Foods, Inc.; Louisiana Court of Appeal, First Circuit. No. 5165, Jan. 30, 1961.

EXCLUSIVE REMEDY—Common-Law Negligence Action by Employee Against Co-Employee's Right to Indemnification From Employer

Decedent was killed in the course of his employment when he came into contact with high tension wires. His executrix sued the defendant, a co-employee, and nine others, in a wrongful death action; and the defendant sued the employer contending that, if he (the defendant) were held liable, he should be entitled to reimbursement from the employer. He claimed that he was not negligent and that, should it be determined that he were liable to the plaintiff-executrix, he should be indemnified by the employer for such liability by reason of the fact that he was acting as an employee pursuant to specific instructions by the employer. The trial court dismissed the third-party complaint on the ground that the "exclusive remedy" provision of the New Jersey Workmen's Compensation Act would bar the executrix from proceeding directly against the employer on a common-law action and that to allow the defendant to sue the employer would be doing the same thing indirectly.

On appeal, the decision was reversed. It was stated that an employer may be made to respond indirectly for damages recoverable by an injured employee beyond the liability imposed by the Workmen's Compensation Act, on principles of express or implied indemnification. Therefore, where a co-employee is held liable in a negligence action to a fellow-employee, for doing in good faith what he was specifically instructed to do by his employer, the employee should be indemnified by the employer. In such a case, the law implies a right to indemnification and the exclusive remedy provision of the Act is not a bar. Reversed and remanded.

Hagen vs. Koerner; New Jersey Superior Court, Appellate Division. No. A-793-59, December 27th, 1960.

West Coast's Maintenance Show

The need for specialized plant upkeep is the theme of the Western Plant Maintenance & Engineering Show at the Los Angeles Pan Pacific Auditorium July 18–20. The increasing complexity of upkeep work will be reflected in the Western Plant Maintenance & Engineering Show and its concurrent technical conference, first of its type since 1957.

Exhibitors and lecturers will deal with many aspects of the modern plant, its safety insulation, lighting, heating, air quality, furnishings, and cleanliness. Other participants will offer products and advice for preventing costly plant breakdowns, for testing equipment, lubricating machinery, repairing breakdowns, standardizing replacement parts, improving efficiency of maintenance crews, etc.

Industrial Building Show & Congress

The second Industrial Building Exposition & Congress, it has been announced by Clapp & Poliak, Inc., the New York exposition management firm, will be produced at the New York Coliseum, Sept. 25 through 28. Exhibits will cover the two main floors of the Coliseum. The extensive program of the congress will cover all major aspects of new construction and modernization.

Exhibits and program topics will be directed to three types of audiences. These include companies which have a continuing program

(Continued on page 48)

THE FIRE FRONT

Fire Protection Lab

A newly-equipped $30,000 hydraulic laboratory to be used in fire protection training was opened at Illinois Institute of Technology on May 19. The new laboratory will be used by students enrolled in IIT's fire protection and safety engineering courses. Research and testing are other uses to be made of the laboratory. It is located in the main building on the Illinois Tech campus.

According to Professor Gerald L. Maatman, IIT director of the fire protection and safety engineering department, the addition of the laboratory represents another step in providing IIT with the most modern and best facilities possible for the education of prospective fire protection and safety engineers.

To mark the official opening, dedication ceremonies and a special luncheon was held. Some 100 Illinois Tech alumni in fire protection and safety engineering attended.

Fire Losses Involve People

The obligation to educate owners and managers in the human side of property conservation was stressed in an address by George F. Wahl, general manager, Factory Mutual Engineering Division, at the annual meeting of the National Fire Protection Association in Detroit on May 16.

"Published loss-prevention standards in themselves do not entirely fulfill our obligation to the public," he said. "We must work harder in the educational area, fitting ourselves to do a better job in presenting our know-how to the public, encouraging society to accept its responsibility for conservation of life and property."

April Losses Drop

Estimated fire losses in the United States during April totaled $95,486,000, the National Board of Fire Underwriters has reported. The April figure was 12.6 percent below the $109,220,000 for March of this year, and 2.7 percent under the $98,106,000 for April, 1960, according to Lewis A. Vincent, NBFU's general manager. In the first four months of this year, the dollar value of property damaged or destroyed by fire was $438,566,000, an increase of 8.5 percent over the $404,202,000 for the like period of 1960. These estimated losses include an allowance for uninsured and unreported losses.

Catastrophe fire losses in industry seriously interfere with prodduct or use of the plant, hurt the people involved economically, sometimes physically. According to Mr. Wahl, "the frequency of catastrophe in American industry is about one in three thousand losses. Changes that have occurred in the past fifty years are often factors in large losses. Increased use of flammable liquids and gases, large fire areas, economic growth, employee turnover, incomplete sprinkler protection, reduced fire-department budgets are all a part of today's society and very likely here to stay.

"After every industrial catastrophe we look for the reasons. Too often the quick and obvious answer is superficial; we fail to assign the responsibility to the many who are involved. It usually boils down to a management unacquainted with loss-prevention fundamentals, who have taken their obligation to conserve too lightly."

In outlining what makes a good conservation policy, Mr. Wahl pointed out that conservation involves the integration of five elements into an economic and practical program for the owner:

(1) Recognition of combustibility.

(2) Recognition of unsuspected ignition sources.

(3) Automatic detection, effective only when its call for help is answered.

(4) Fire control, for which automatic sprinklers are best, providing also automatic detection.

(5) And finally people—"first of all the owners, the management, the people in control. They take the lead and appoint proper staffs to carry out the program. People must be continuously trained all the way down to the workman level with a sound conservation philosophy by example from top executives, department section heads, all the leaders."

Fire Prevention Is Paying Off

While estimated fire losses last year rose to a record high of $1,107,824,000, an increase of 5.8 percent above 1959, the National Board of Fire Underwriters has reported that fire prevention is paying off. The report of Robert Z. Alexander, chairman of the National Board's Committee on Statistics and Origin of Losses, and president of the American Insurance Company, to the National Board membership at its 95th annual meeting in New York stated:

"Despite this fourth successive year with fire losses in excess of a billion dollars, our fire prevention authorities are of the opinion that fire prevention engineering and educational activities have been instrumental in holding down the real loss as contrasted with the dollar loss which reflects the progressive inflation of the dollar since 1926."

Building fires in all United States communities of 2,500 population or more last year totaled 437,023, an increase of 4¼ percent over the 419,556 for 1959.

(Continued on page 44)

It's the same story every year. The rains quit around April and by July California has been sunbaked to a crisp. Clay soil cracks into county-size jigsaw puzzles. Wild grasses wither and turn brown, so dry they crackle underfoot. The U. S. Forest Service resignedly prepares for another siege of forest fires.

AIR-RAID

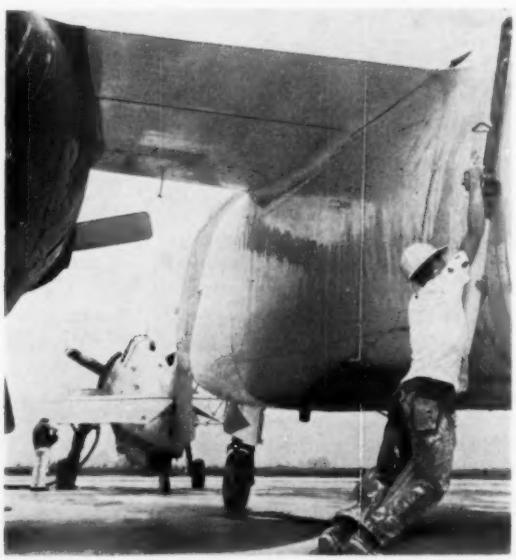
Aerial warfare against forest fires in the West's valuable timber and watershed lands began three years ago, when converted Air Force and Navy bombers were first employed to drop fire retardant chemicals. This year a new "weapon" has been introduced by the U. S. Forest Service—the North American AJ-1 Savage—a carrier-based attack bomber now retired after a decade of service with the U. S. Navy.

Crew Chiefs watch for return of their tankers from control tower of U. S. Forest Service base, which is run like a fighter base. Speaker calls pilots to airplanes.

The AJ-1 has the speed to get to the fire areas in a hurry—230 knots with full load (2000 gallons of chemicals). This speed-load combination makes the Savage about three times as effective as the biggest tanker previously used for the work. Yet because of its big wing area, it can throttle back to 115 knots (safe flying speed even if one engine should quit) and still perform with ease the gut-wrenching maneuvers into canyons and over ridges demanded in fire fighting.

The chemical is carried in a special tank whose four self-sealing doors form the underside of the fuselage. The load can be dropped in any sequence or combination of 500 gallons or salvoed in one grass-

(Continued on page 44)



A Forest Service crewman refills the tank of a USFS AJ-1 with Bentonite during a recent forest fire.

ON FOREST FIRES

An AJ-1 firefighter salvoes full 2000-gallon load in a practice drop. Normal drop altitude is 75 feet.

Taking a break while tankers are airborne, USFS ground crewmen cool off in 100-degree heat of a busy day.

Forest Fires
(from page 42)

flattening splash. Two chemical mixtures are used—borate and bentonite, both powders dissolved in water to a gooey consistency.

Borate will prevent fires on anything it coats for up to three days. Its disadvantage is its weight—11 lbs. per gallon. Bentonite—9 lbs. per gallon and cheaper in cost—is being used increasingly. However, it lasts as a fire preventive only about 12 hours.

The air-dropped chemical is not a bomb, nor is it used primarily to put out flames. It may be used occasionally to snuff out a small blaze, or an escaping finger of fire from a big one, but its most common use is as a retardant, dropped ahead of approaching flames in support of bulldozers and men laboriously scratching out firebreaks on the ground. The best altitude for dropping either chemical is about 75 feet. Higher, it tends to spread apart and is ineffective in covering; lower altitudes can be dangerous to personnel fighting the fire below. A full load has been known to uproot trees up to 6 inches in diameter.

Fire-fighting planes operate from airfields run much like a military base. Typical is the Initial Attack Base at Chino, California, main base for the Los Angeles area. During the state's fire season, pilots and Forest Service men stand by from dawn to dusk. Their degree of readiness is clued to a plan number which runs from 1 to 13 depending on the temperature, humidity and probability of a blaze. From Plan 10 on, the tankers are kept fully loaded with fire retardant, since this means the weather is so hot and dry a fire in some part of the southern half of the state is only a matter of time.

Pictures from Authenticated News.

Fire Resistance of Building Materials

Today the fire resistance of all building materials is being studied more closely than ever in history. Old and new materials and construction methods are being subjected to severe fire tests at an ever-increasing rate. One of the newer construction methods—that of prestressed concrete—is being watched by architects, engineers, building officials and insurance companies.

Within the last three years more than 40 standard fire tests have been conducted in the United States on prestressed concrete building components. A. H. Gustaferro, construction engineer of the Portland Cement Association, Chicago, stated that test data now available show that prestressed concrete can be designed to provide any required degree of fire resistance.

Gustaferro spoke before the South Florida section of the American Society of Civil Engineers on May 4. He said that fire resistance of prestressed concrete is affected principally by three factors: (1) concrete cover over the prestressing steel, (2) size of the member, and (3) degree of restraint.

Tests conducted at the new fire research laboratories of the Portland Cement Association in Skokie, Illinois, indicate that fire endurance for prestressed concrete may be improved by increasing the cover, or by providing some restraint in the construction. The amount of restraint required appears to be relatively small. Fire tests on duplicate specimens of prestressed building members have given almost identical results, indicating that performance is predictable.

Underwriters' Laboratories at Northbrook, Illinois have conducted a number of fire tests on prestressed concrete slabs as well as on joist-type members. UL provides 2-hour fire resistance label service for most double-tees and channels produced in this country.

Thus far, six tests have been successfully conducted on flat, hollow-core sections at Underwriters' Laboratories. All of these have qualified for at least 2-hour label service. None of them failed structurally when subjected to the severe treatment of ASTM (American Society for Testing Materials) standard fire test. Additional tests on double-tees and on post-tensioned beam-and-slab construction have been performed at the Fire Prevention Research Institute at Gardena, California.

A task committee of the Illinois Section of the American Society of Civil Engineers has recommended tentative fire resistances for prestressed concrete from one to four hours. Their recommendations are dependent upon concrete cover over the prestressing steel, and the size and shape of the member. For example, beams or joists with 2½ in. concrete cover and having a cross-sectional area of 150 to 300 sq. in. would qualify for two hour fire resistance. Beams larger than 300 sq. in. in cross-section require only 2 inches of cover for 2 hour resistance.

Fire Prevention
(from page 41)

Residential fires in 1960 numbered 310,251, an increase of 8½ percent over the 285,796 for 1959. Fires in manufacturing structures totaled 22,893, an increase of 5¼ percent over the 21,760 in the preceding year; mercantile establishments 48,106, an increase of 3 percent over 46,651 for 1959; nonresidential assembly (churches, schools, meeting halls, etc.) 17,569, an increase of 1 percent over 17,409 a year earlier; and fires in storage structures 7,351, up 6½ percent over 6,898 in the preceding year. Fires in the miscellaneous category at 30,853 were down 4¾ percent over 41,042 in the preceding year.

Causes of Ignition

Matches and smoking continue to be the chief cause of fires, accounting for 23.7 percent of the total in the seven years ended December 31, 1959, according to a tabulation by the National Board.

Another 20.4 percent of all fires are caused by misuse of electrical equipment.

Lightning, the third largest single cause of all fires, accounted for 12.1 percent of the total.

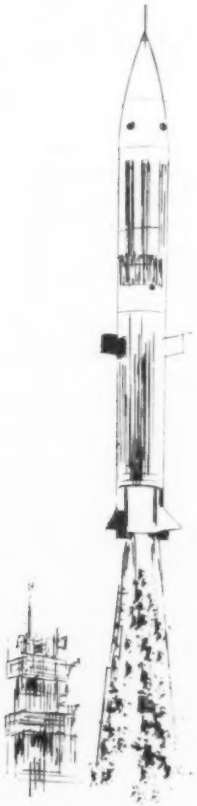
Combustible materials used in buildings and other structures continue to lead among materials ignited in fires. A National Board study shows such materials were ignited in 24.4 percent of all fires in the seven years ended December 31, 1959. Cloth and other fiber products were the materials ignited in 20.3 percent of all fires; grease, fats, paraffin and similar flammables, 14.2 percent, and furniture and fixtures, 12.1 percent.

New Answers to New Chemical Fires

by **DR. EDWARD L. HARRIS**
Technical Consultant
Wright Air Development Division
Dayton, Ohio

Theoretical studies have been made for the relative hazards from fire and explosion in the manufacture and handling of flammable chemicals. The relative degree of fire and explosion danger, based on boiling point, flash point, lower limit of explosibility and vapor density, can be computed for each chemical. The relative danger values for the common hazardous chemicals are: ammonia 204, carbon monoxide 261, toluene 364, ethylene 342, acetane 344, ethane 349, benzene 364, acetylene 364, hydrogen sulphide 371, ethylene oxide 380 and ethyl ether 405.

Many chemicals, increasingly used—such as rocket fuels and oxidizers, liquid metals, plastics, solvents—are highly reactive and require special fire precautions.



Certain chemical fuel stocks, such as JP-4, low pressure distillate, aviation alkylate, and some solvents generally produce explosive vapors during loading time. Carbon dioxide blanketing has been proposed for tanker and barge loading. A blanket of carbon dioxide is believed to isolate the static discharge, which is assumed to occur at the interface from explosive vapors present in the barge or tanker. Studies conducted by the Bureau of Mines (Coward, H. F. and Jones, G. W., *Limit of Flammability of Gases and Vapors, Bulletin 503, Bureau o, Mines*, Washington, D. C.) have indicated that a reduction in the oxygen content below 14 percent, using CO_2 as a diluent, reduces the probability of an explosion.

During the pumping of fuel from blanketed shipping vessels to storage containers, a marked loss of carbon dioxide is noted. It is most remarkable that CO_2 can be used as a protective agent in loading and shipping and make itself absent when the fuel is available for consumption. This desirable property is mainly due to the limited solubility of CO_2 in hydrocarbon fuels. Experiments conducted at Wright Air Development Division show a maximum absorption of only 0.02 percent for fuel at a temperature 7°C. and atmospheric pressure. These experiments further show that the solubility of carbon dioxide at atmospheric pressure decreases with a rise in temperature, length of time in storage and mechanical agitation.

Rocket Fuels

Liquid propellant fuels and oxidizers are, in general, highly reactive chemicals. Consequently, the propellants and their reaction products possess certain hazardous properties which must be fully understood by all who handle them. Accordingly, information on the properties of these materials is

given so that hazards may be recognized and understood. Many new plastics and solvents increasingly used in today's industry, as well as the low temperature melting liquid metals, increase the industrial hazards in today's operations.

We must meet today's hazards with improved and more effective methods. For instance a new chemical compound, considered to be twice as effective as any other extinguishing agent against liquid fuel and electrical fires, has been adopted for emergency use at Army installations. This new compound is known as monobromotrifluro methane. The compound can be used to prevent fires by mixing with helium or nitrogen, thereby creating a combustion-free atmosphere, allowing dangerous jobs to be conducted in safety.

Discharge Device

Standardized along with the agent is a special cylinder that weighs 3 pounds and holds one quart of the compound. The container features a specially designed nozzle that can discharge the fluid in from 10 to 12 seconds.

Developed by the Army Engineer Research and Development Laboratories, Fort Belvoir, Virginia, the new agent can be used in temperatures at 65 degrees below zero and will be particularly helpful in the Arctic, where fire is a crucial problem.

Other studies are being made on the means of extinguishing fires in flammable liquids. These studies include the use of vapor phase inhibiting agents and the possibility of extinguishing fires in buildings by filling the interior with inert gas.

Experiments with inert atmospheres are now going on with specially adapted jet engine generators. This generator is described on page 929 of the June 3, 1960 issue of the British Engineer Journal.

Chemical Hazards

The three hazards prevalent in industrial operations involving hazardous chemicals are: *fire, explosion and toxicity (poisoning or chemical burns).*

Fire: Fuels and oxidizers must be kept separated. Hazardous chemicals should be stored in quantities no larger than can be handled adequately by the local fire-fighting equipment. Both the fire-fighting equipment and fire extinguishing agent must be suited to the type of fire which may occur with a particular fuel or oxidizer.

Explosion: The principles guiding the elimination and control of fire hazards are generally applicable to explosion hazards as well. In addition, earth, sand, concrete, or metal barricades of sufficient mass should be provided in appropriate places to decrease the effects of an explosion. Shock-sensitive materials must be protected from vibration and impact.

Toxicity: Prevention of poisoning and chemical burns of tissues of the body requires proper engineering design of operations, including adequately designed ventilation; appropriate personal protective practices and equipment; periodic health surveillance procedures; and health education and supervision. Indoors, ventilation is often a matter of first importance. The choice between local-exhaust and general ventilation is dictated principally by the magnitude and nature of a given operation, and the degree of toxicity of the material.

As a general index of toxicity, many chemicals are assigned maximum allowable concentration values (MAC). These are concentrations in the air in parts per million (ppm) or in other appropriate units, to which a person may be exposed 8 hours a day for indefinite periods without injury to health. The values represent the concensus of a group of authorities on the subject, based on the best information available.

Fire Fighting Techniques

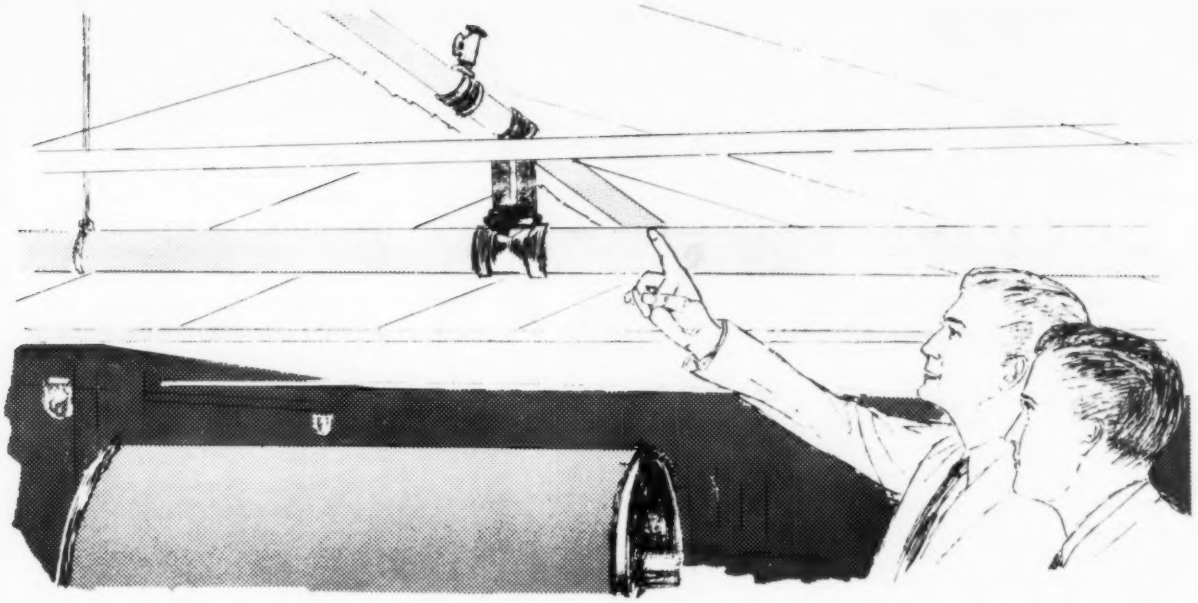
Water is the most universally applicable fire-fighting agent. However, there are critical exceptions to application of water as a fire extinguishing agent for chemical propellants. These exceptions concern special-type fires, and also concern class C (electrical) fires. The primary special-type fires which are exceptions in this instance are those involving fluorine and chlorine trifluoride, molten metals such as sodium, potassium, etc. Let's take a closer look at the techniques employed in fighting fires caused by the active metals sodium and potassium.

Liquid Sodium Fires: Liquid sodium when exposed to air ignites at temperatures as low as 230°F; in a comparatively dry atmosphere it will burn quietly giving off clouds of dense, white, caustic smoke. The temperature of the burning mass increases rapidly to 1500° and 1600°F. In this condition it will spall concrete; consume asbestos;

(Continued on page 48)

Table 1: Fire Fighting Agents For Rocket Fuels and Oxidizers

FUELS	SUITABLE EXTINGUISHING METHODS
Hydrocarbon Fuels, Alcohols, Aniline	Use Class "B" fire fighting methods, such as dry chemical, carbon dioxide, foam, vaporizing liquid (carbon tetrachloride)
Hydrazine, Uns. Dimethylhydrazine, Liquid Ammonia	Use copious quantities of water
OXIDIZERS	
Hydrogen Peroxide (90%), Fuming Nitric Acid	Use copious quantities of water
Fluorine, Chlorine Trifluoride	Violent reactions occur with water; any attempt to extinguish is futile. Allow to burn out and evaporate. Devote efforts to reduction of secondary fires.



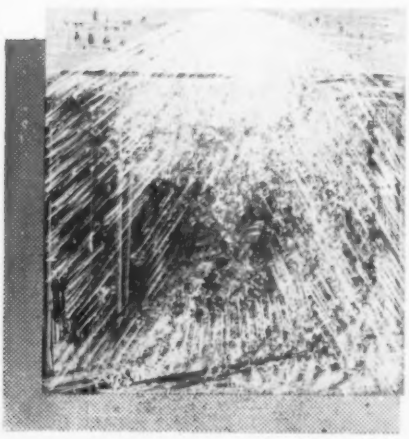
Sprinklers Guard Vital Production

HOW TO CONTROL PAPER-MACHINE FIRES

The management of the Tilo Roofing Company in Stratford, Conn., recently authorized the installation of twelve automatic sprinklers under the hood at the dry end of their paper machine.

They were convinced that the sprinklers were necessary in order to protect a machine so vital to production, and to eliminate the possibility of operations being disrupted by a serious fire at this point, explains a recent issue of the Factory Mutual Record.

Fire experience clearly justifies their action. The wet end of a paper machine is safe enough because the paper fibers are still suspended in water. As the paper passes through the steam-heated drier rolls, water is removed and the hazard begins. Not only can the paper now be ignited, but oily paper-dust deposits also provide quick, convenient fuel to start a fire. Damage to the woolen felt which carries the paper sheet through the machine means that production must stop until a new felt is installed.



What Causes Paper-Machine Fires?

An overheated bearing that ignites oily deposits is the most frequent fire cause. It is usually the result of inadequate lubrication and occurs mostly on older machines not having a central lubricating system.

Friction and mechanical sparks start nearly as many fires as hot bearings. Frictional heat is produced by paper chokes between drier rolls or at belts, gears, clutches and other moving parts. Mechanical sparks are produced by worn parts, broken shafts or gears, or by excessive end play at rolls.

Arcing in motors particularly is another common fire cause. Overlubrication usually results in oil-soaked insulation which soon deteriorates, causing breakdown, short circuit and fire. Oily motors collect dust and fibers which cause overheating and eventual ignition.

Sparks from cutting or welding torches carelessly used have started fires at paper machines.

Static electricity, lightning, carelessness of smokers, spontaneous heating in ducts, flammable liquids used for cleaning, and paper in contact with hot steam pipes in paper-scrap pits are other fire causes.

How to Prevent and Control Fire

- **Good housekeeping is essential.**
- **Shut down the machine periodically for inspection.**
- **Clean up oil, grease, and dust deposits on machine surfaces, under hoods, and in ducts.**
- **Provide good lubrication, good machinery maintenance, and good electrical maintenance.**
- **Carefully supervise cutting or welding in the vicinity.**

• **Avoid low-flash-point solvents for cleaning calender rolls and other surfaces.**

In noncombustible machine rooms, automatic sprinklers are needed under hoods, at the ceiling over the drier section if there is no hood, at the ceiling over calenders and windup reels, in scrap-paper pits, and in large exhaust ducts. Combustible machine rooms need sprinklers under the entire ceiling as well as under machine hoods.

When fire is discovered, shut down the ventilating system immediately to prevent the fire from spreading. Small hose and extinguishers should be available. Use water spray instead of a solid stream at the drier drums. Keep the machine running to help avoid uneven cooling stresses in the drums and to lessen damage to the felts.

Building Show
(from page 40)

of building new plants; companies which rarely build new plants but have one planned or under construction; and companies which have problems of modernization.

Exhibits will cover eight major categories: structural materials and components; mechanical components and equipment; electrical components, materials and systems; heating and air handling; employee services; plant sites and services; financing; and auxiliary services.

Visitors who plan to attend should write to Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y., for rapid registration cards, congress programs and hotel information.

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Chemical Fires
(from page 46)

react with glass, fire brick, transite, and similar materials.

It also reacts violently with such common fire extinguishing agents as water, carbon dioxide, and carbon tetrachloride. When carbon tetrachloride is used on a fire, it gives off the highly toxic phosgene gas. *This group of extinguishers should never be used to combat fires in liquid metal areas.*

The safest extinguishing materials for liquid sodium and NaK (a sodium-potassium alloy) are *dry* sodium carbonate (soda ash) and specially treated sodium chloride, available commercially for metal fires. Powdered graphite is also acceptable. Soda ash is not recommended when storage is required over extended periods of time before use.

A sodium fire burns very quietly, cannot explode by itself, and can be approached closely without danger so long as water and other antagonistic materials do not come into contact with it. Characteristics of burning sodium are very distinctive: there is no flame but instead there are a large number of bright yellow glowing spots covering the surface of the metal.

To put out sodium fires, sprinkle, dump, or expel from an extinguisher liberal amounts of soda ash or the special sodium chloride powder to cover the burning spots as they appear. Use caution to prevent splashing.

Lithium Fires: Zirconium silicate and powdered graphite are acceptable for liquid lithium. Soda ash is not recommended since it reacts violently with the lithium.

NaK Fires: To extinguish sodium-potassium alloy fires, the burning bubble should be dyked and the dry chemical then sprinkled on top to blanket the flame. In general, NaK can be handled as sodium is handled, but it must be remembered that:

1. *NaK is liquid at ordinary room temperatures.*
2. *Potassium is more reactive and may tend to form the higher oxides which react explosively with potassium and sodium.*

Keep the exposure time down to an absolute minimum when handling NaK. If at all practical, keep an inert-gas blanket over the surface. Explosions that have occurred involved, generally, solid potassium, potassium oxide or reactions of potassium and potassium oxide with hydrocarbons. The actual cause for such explosions is at present unknown.

Chemical Propellants (Fuels & Oxidizers): The most commonly used rocket fuels may be grouped in the following categories:

1. Hydrocarbon fuels such as JP-4 Avgas, etc.
2. Alcohols such as Ethyl Alcohol, Methyl and Furfuryl
3. Amines such as Hydrazine, methyl hydrazine, unsymmetrical dimethylhydrazine and Ariline.
4. Nitro Hydrocarbon fuels such as Nitromethane and n-propyl nitrate.

The most common oxidizers are:

1. Hydrogen Peroxide (90%)
2. Liquid Oxygen
3. Fuming Nitric Acid
4. Nitrogen Tetroxide
5. Fluorine
6. Chlorine Trifluoride

For extinguishing agents suitable for fighting fires in these fuels and oxidizers, see Table 1. Small spills of fluorine may be handled by remote application of water fog to promote smooth, rapid combustion of the fluorine.

Propyl Nitrate once ignited will burn when the surroundings are above its autoignition temperature even if covered with carbon dioxide blanket. Burning will continue until the surroundings are cooled below its ignition temperature.

From an address presented at the 8th Annual Industrial Fire Control Conference at Purdue University. Picture by courtesy of Walter Kidde & Co.

The B. F. Goodrich Footwear and Flooring Company, Watertown, Massachusetts, was twice honored recently for outstanding achievement in its safety programs. Charles L. O'Reilly, President of the Massachusetts Safety Council, presented John C. MacKinnon, General Manager of the company, the National Safety Council's "Award of Honor" for attaining 109 days, or 3,014,444 man-hours, without a disabling injury. It is the second time in five years that the company has received the "Award of Honor."

Mr. MacKinnon also accepted a joint award of the Massachusetts Safety Council and the Associated Industries of Massachusetts from Mr. O'Reilly and John Hamilton, Director of Public Affairs for the A.I.M. The "Meritorious Achievement Citation" was presented for 3,211,770 man-hours without a disabling injury. It is the second time in two years the company has been so honored.

In accepting the awards, Mr. MacKinnon stated that all members of industry's team benefit from successful safety programs—the employee, his family, and management.

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The National Safety Council's 1961 Association Safety Award has again been won by the Institute of Scrap Iron & Steel of Washington, D. C. William S. Story is the Institute's executive vice president and Fred Gordon of the Iroquois Steel & Iron Co., Chicago, the chairman of the Subcommittee on Safety. This year's award is the fourth the Institute has received in the past six years.

Howard Pyle, Council president, praised the Institute for the "practical proof you are providing that accident prevention works." He commended the Institute for adding "immeasurably to our knowledge of successful association safety work."

The Institute represents the iron and steel scrap processing industry. Its more than 1,200 members handle 95 percent of all ferrous scrap consumed in this country.

In the association's own safety contest, the Northwest chapter has presented four safety awards to chapter members. The safety contest, which is run through national headquarters of the Institute, is designed to help reduce the volume of accidents in iron and steel scrap processing yards by making management and employees more safety conscious.

Presented with Certificates of Safety Achievement, for having no accidents during the period of the contest (Jan. 1–Oct. 31, 1960), were the following: Phillip Greenberg & Co., St. Paul; Pitts' Inc., Sioux Falls, S. D.; and H. S. Kaplan Scrap Iron & Metal Co. Inc., St. Paul.

A Letter of Safety Commendation went to Martin Bush Iron & Metal Co., Minneapolis, for having an accident rate which was lower than the national average as established by the contest.

The St. Louis chapter of the Institute has presented two safety awards to chapter members. Presented with Certificates of Safety Achievement were the following: Murphysboro Iron & Metal Co., Murphysboro, Ill., and Paul's Inc., Sikeston, Mo.

• • •

Grove Valve and Regulator Co. has been presented an award for outstanding employee safety achievement by the Pacific Employers Insurance Company. The presentation was made to Grove president John W. Collins by Milton Thornton, vice president of the Pacific Employers Insurance Co.

Thornton said that Grove Valve's employee safety record in 1959–1960 was an outstanding performance for a manufacturing company in the 38 years of the awards. Grove, with 240 Oakland employees, had four disabling accidents in more than one-half million man-hours worked.

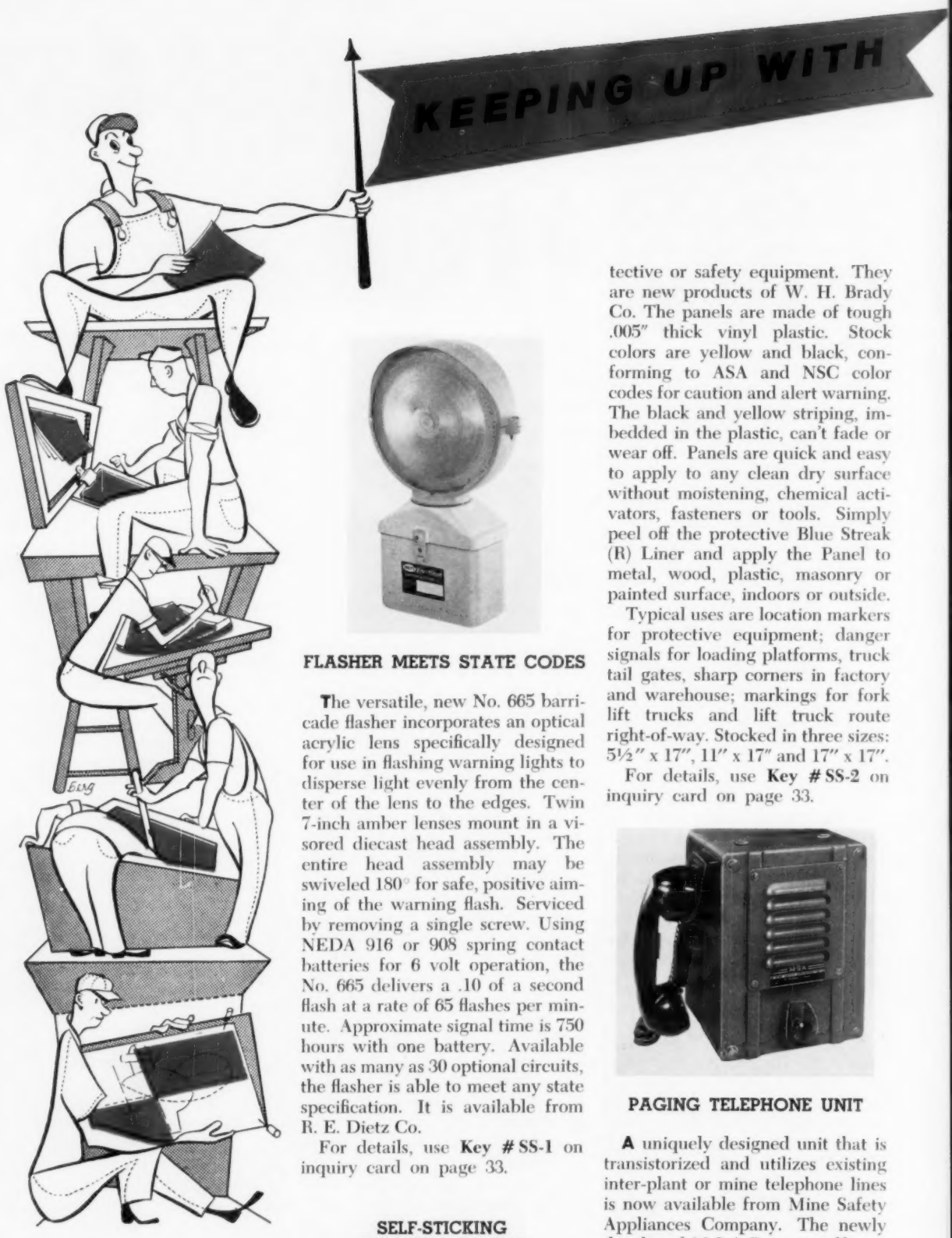
• • •

For the first time in the company's history, Du Pont's 90,000 employees in April worked through a complete calendar month without a disabling injury. Employees in more than 100 locations throughout the country worked safely for more than 14 million man-hours to establish the record.

Crawford H. Greenewalt, president of Du Pont, sent a message to all company plants, laboratories, construction projects, and district sales offices saying, "Let us extend this accomplishment to make '61 a banner safety year. My warm congratulations to you and your people."

Du Pont recently received the National Safety Council Award of Honor for its safety performance in 1960, when the company's frequency rate for disabling injuries was 0.41 per million man-hours worked. This compares with the latest available frequency rate for the chemical industry of 3.32 and for all industry 6.47 injuries per million man-hours.

Also announced is an unprecedented safety record—almost 32 years without a disabling injury on the job—by employees of Du Pont's Elastomer Laboratory at Chestnut Run, Del. Since July 1, 1929, the day the laboratory first opened at its original location at Deepwater Point, N. J., it has operated more than 5.8 million man-hours without a disabling injury. This has been achieved despite such laboratory hazards as high pressure steam equipment, acids, flammable liquids, fumes, and wringers.



FLASHER MEETS STATE CODES

The versatile, new No. 665 barricade flasher incorporates an optical acrylic lens specifically designed for use in flashing warning lights to disperse light evenly from the center of the lens to the edges. Twin 7-inch amber lenses mount in a visored diecast head assembly. The entire head assembly may be swiveled 180° for safe, positive aiming of the warning flash. Serviced by removing a single screw. Using NEDA 916 or 908 spring contact batteries for 6 volt operation, the No. 665 delivers a .10 of a second flash at a rate of 65 flashes per minute. Approximate signal time is 750 hours with one battery. Available with as many as 30 optional circuits, the flasher is able to meet any state specification. It is available from R. E. Dietz Co.

For details, use **Key # SS-1** on inquiry card on page 33.

SELF-STICKING WARNING PANELS

Self-sticking, diagonally striped panels give visual signal of safety hazards or mark the location of protective or safety equipment. They are new products of W. H. Brady Co. The panels are made of tough .005″ thick vinyl plastic. Stock colors are yellow and black, conforming to ASA and NSC color codes for caution and alert warning. The black and yellow striping, imbedded in the plastic, can't fade or wear off. Panels are quick and easy to apply to any clean dry surface without moistening, chemical activators, fasteners or tools. Simply peel off the protective Blue Streak (R) Liner and apply the Panel to metal, wood, plastic, masonry or painted surface, indoors or outside.

Typical uses are location markers for protective equipment; danger signals for loading platforms, truck tail gates, sharp corners in factory and warehouse; markings for fork lift trucks and lift truck route right-of-way. Stocked in three sizes: 5½″ x 17″, 11″ x 17″ and 17″ x 17″.

For details, use **Key # SS-2** on inquiry card on page 33.

PAGING TELEPHONE UNIT

A uniquely designed unit that is transistorized and utilizes existing inter-plant or mine telephone lines is now available from Mine Safety Appliances Company. The newly developed M-S-A Pager is self-contained and has two primary functions—to call or page over a loud speaker and to communicate semi-privately by telephone. It is highly

SIGN & SIGNAL DEVELOPMENTS

adaptable for use in mines, factories, refineries, mills, and other locations. It is powered by two dry cell, long life batteries, employed only when the unit is in use. The transistors have no filaments and are vibration proof. A two-conductor wire connects Pagers to each other, and to existing telephone lines.

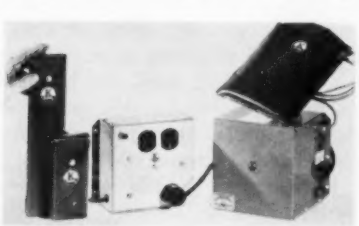
Ten or more units can be installed on a single line, making it quite simple for a key man to be paged from a number of points simultaneously. In answering, a lift of the handset transforms the Pager into a telephone for semi-private conversation. Two control adjustments adapt it to characteristics of the telephone line in use.

For details, use **Key # SS-3** on inquiry card on page 33.

PORTABLE ALARM TRANSMITTER

A new alarm named the Port-O-Larm which uses a miniature pocket-size radio transmitter to signal a fixed receiving unit has been introduced by the Kidde Ultrasonic & Detection Alarms Division, Walter Kidde & Company, Inc. When a button on the small transmitter is depressed, a pulsating radio signal is sent to the receiver which causes an alarm to sound locally, remotely or at a central station. It can also control lights and other electrical equipment. The Port-O-Larm can be used, for example, by bank tellers or sales personnel to report holdups, by plant guards to signal trouble, or by police to turn store lights on or off from the street.

Two transistorized transmitters are available. One is 10″ long, weighs only 15 ounces, and has a range of 120′. The other is 5″ long, weighs 10 ounces, and has a range of 100′. The transmitters operate on a long life 15 volt AC battery and the receiver on 115 volt AC power.



For details, use **Key # SS-4** on inquiry card on page 33.

FLASHER STAND

A new safety light standard, to provide both flasher and barricade protection, is announced by R. D. Fageol Co. The Porta-Stand can be used in conjunction with all Fageol Flasher Lights of 4 and 7 inch lens sizes. The swivel head turns to protect all 4 directions. Head guard is optional. Lettering is in Scotch-lite red on highway yellow and can be easily seen day or night. Height of standard can be adjusted from 50 to 84 inches. Base is ¼ x 2 x 24″ diameter and provides extremely high wind and impact resistance. Hinged handles hold barricade boards for protecting sizable hazards and work crews. Weight is 22 lbs.

For details, use **Key # SS-5** on inquiry card on page 33.

COMPACT TWO-WAY RADIO

A new space-saving table model two-way radio has been designed by General Electric Communication Products Department for economical use by businesses, governmental agencies and military services. Units up to 60 watts are available in low band (25–54 mc. and 72–76 mc.), up to 50 watts in high band (144–174 mc.) and 15 watts in UHF (450–470 mc.). Depending on the frequency selected, power amplifying equipment can be obtained on an optional basis, providing 250/330 watts output.

Also on an optional basis, units with selective-calling features can be made available, enabling the dispatcher to give a message to a single person or group of persons. The new table-model equipment may be used to talk to in-plant vehicles, cars or trucks on the road, shoulder-strap portables or shirt-pocket radios on the same frequency.

For details, use **Key # SS-6** on inquiry card on page 33.

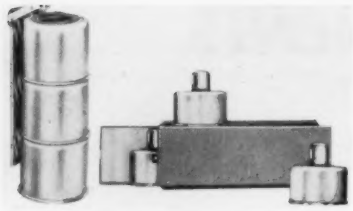
ALARM BOX IDENTIFIERS

Alarm box pole-painting is eliminated by Plazmark, a new plastic identifying material being introduced. Made by National Marker Corp., Plazmark is a flexible plastic sheet, produced on rolls, in 10, 20 or 30 yard lengths, 26″ wide. Its surface is a highly-reflective silver and red combination, embossed to heighten brilliance. Letters F-I-R-E appear in silver against a red background, with silver borders. The inexpensive marker is fade-resistant, weatherproof, cannot tear, and is impervious to creosote. It is easily cut to desired length, and simply stapled in place on a wood pole.

For details, use **Key # SS-7** on inquiry card on page 33.

ALL WEATHER FLARE KITS

New V-3 bracketed flare kit and CC-30 boxed Flare Kit, meet I.C.C. and state regulations for oil burn-



ing flares, and are U.L. approved. Weather designed and tested, these flares will withstand 45 mph winds and burn brightly in rain or snow, insuring maximum safety. Both flare kits are leakproof and are constructed of heavy gauge steel by R. E. Dietz Co. The V-3 features a retractable burner, making it very compact and assuring a primed wick for instant lighting. Snuffer cap and flag staff socket on each flare. Comes complete with rigid flat bracket and retainer arm, predrilled mounting holes.

The CC-30 Oil Flares utilize a fixed type burner. Cap is a triple bayonet lug snuffer with grip chain and flag staff socket. All three flares fit snugly in compact double flanged box with an easy end opening. Height of flares is the same as diameter permitting mounting of box in a vertical or horizontal position using pre-drilled mounting holes in box flange. Space in box also for fusees and flags as required.

For details, use **Key # SS-8** on inquiry card on page 33.

WIRELESS INTERCOM

Production of a completely portable inexpensive intercom called The Bennett has been announced by Precision Equipment Co. It provides instant two-way communication without connecting wiring. They are merely plugged into electric outlets. Up to eight additional units may be used and all stations will be heard with the same clarity at the same volume. They can be moved from place to place in the plant as required. The sensitive Alnico V Speaker-microphone picks up normal conversation within twenty feet. Automatic squelch control is another feature.

For details, use **Key # SS-9** on inquiry card on page 33.

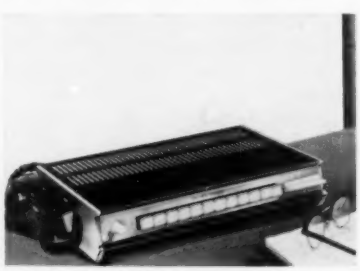
NON-CODE ALARM STATION

The Gamewell Company announces a new unit known as the Flexalarm **Century** Non-code Fire Alarm Station. Shock and vibration resistant, this unit is designed for interior use as a small emergency signalling station which does not detract from the decorative aspects of a building's interior. Operation of the station is single action, positive and fool proof. Pulling bullseye alarm lever forward transmits alarm and locks in "out" position until reset by authorized person. A breakglass rod is provided with this station but its use is optional. The unit is for universal use for all types of inerior non-code fire alarm systems. Unit can be either surface or flush mounted; is listed by U.L. and Factory Mutuals.

For details, use **Key # SS-10** on inquiry card on page 33.

INTERCOM UNIT

Talk-A-Phone Chief Redi-Power, a new all-transistorized model designed to overcome high noise levels and provide complete intercommunication is available from Talk-A-Phone Co. For office and industrial intercom needs, the versatile, all-purpose unit is compact, less than three inches high and lies flat. Self-compensating, it delivers up to a full 20 watts of power to all or any group of stations. Return speech from called stations is received at normal room volume. Standard features include private or non-private operation at the user's choice; incoming call chime; external relay control for extremely high noise level areas; busy signals which visually indicate when a given station is in use; and monitoring signal.



For details, use **Key # SS-11** on inquiry card on page 33.

SAFETY HANDLES ON FOLDING BARRICADE

Rubber-grip handles have been added to the standard Guard-Gate safety barricade made by West Side Iron Works to provide greater ease and safety in opening, closing and carrying. It also has a snap-lock chain latch to make the barricade secure when in collapsed or closed position. Used by industrial plants, highway, police and fire departments, contractors and military establishments for a variety of uses, the compact, all-steel barricade is easily transported and can be quickly set up as a temporary warning or guarding device. Reflectorized, traffic-yellow cross bars assure maximum nighttime visibility. Each unit has mountings for flasher warning lights, flares, signs or extra large flag shafts (¾"). Available in four, six or eight foot lengths, each 36 inches high in open position, and with two red warning flags.

For details, use **Key # SS-12** on inquiry card on page 33.

NURSE'S CALL SYSTEM

Notifier Corporation announces a new nurse's call system, designed especially for nursing homes and small hospitals. As part of the Noti-Call series, the system provides for dual signaling for both emergency and general calls, using both audible and visible means. Components are modular in design, to permit adaptation of all features to any size or type of installation. Thus, a nurse's call system can be tailored to the exact needs of any size institution, controlling the basic costs. For operation, standard 120-volt A.C. current is converted to 12-volt D.C.

For "emergency" calls, a continual chime sound and white lights at the main nurse station are supplemented by white lights at the point of origin—whether activated by a nurse confronted with an emergency situation, or initiated automatically by a patient who leaves his bed against orders. "General" calls, initiated by a patient, are identified by a buzzer and red lights. Optional features include annunciator panels, room lights, bed lights, cancel switches, etc., are optional. System can be expanded as required.

For details, use **Key # SS-13** on inquiry card on page 33.

INSTANTLY INACTIVATES CHEMICALS IN THE EYES OR SKIN

NEUTRALIZE/Bullard

Where speed is so critical in the emergency treatment of acid or alkali splash in the eyes, *Neutralize* works many times faster than water dilution. Neutralize buffering action rapidly inactivates effects of chemical irritants. In 4, 8, 32 ounce and 1 gallon plastic bottles and 5 gallon plastic cubitainer with flow tube.

Write for data sheet.

E. D. BULLARD COMPANY
Sausalito, California

(For details, use Key # G-9 on card on page 33)

NEW TRAFFIC FLASHERS

Three new models of portable flashing light traffic safety devices have been announced by Cripe Tool Mfg. Corp. The Safe-T-Blink models are transistorized. Current is furnished by two standard lantern-type 6-volt batteries which are reported to operate a minimum of 1,500 hours before replacement is required. Twin, seven-inch plexiglas lenses provide two-way visibility at better than one mile, provide 50 to 70 flashes per minute.

For details, use **Key # SS-14** on inquiry card on page 33.

INDUSTRIAL TWO-WAY RADIO

General Electric has engineered a new line of low-priced, lightweight, compact two-way radios for industrial use. Used for in-plant vehicles or in cars and trucks travelling between plants, the small size "Pacer" is easy to mount. The new equipment uses 15 vacuum tubes, 2 transistors and simplified circuits for lower battery drain. (4.2 ampere drain for 15 watts.) Designed for operation in low band (27–50 mc.) and high band (150–174 mc.), the units have full-quality VHF-FM audio. The control section contains a transistorized power supply adaptable to 12-volt negative or positive ground electrical systems. The Pacer model is 4¼" high, 7¾" wide and 12½" long. It was designed to fit under the dash of even the newer, smaller vehicles. It weighs 10 pounds.

For details, use **Key # SS-15** on inquiry card on page 33.

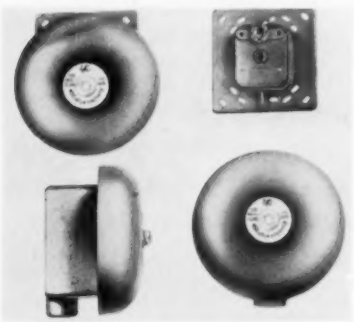
HIGH VISIBILITY TRAFFIC CLOTHES

Available in vests, jackets, mitts, and "Sam Brown" belts, Safety-Glo traffic clothes have alternate stripes of fluorescent "flame orange" for maximum daytime visibility and phosphorescent white to make the wearer actually glow in the dark. During the day, the brilliant orange

stripes will command the attention of drivers, while at night, the luminous white stripes, easily activated by headlights or a flashlight, will create their own warning light.

Made of specially-processed cotton drill and vinyl fabric for long wear by Eastern Metal of Elmira, the Safety-Glo garments are fitted with elastic panels so that one model will fit nearly all sizes. Designed to be worn over other clothing, the garments are available in "ventilated" styles for maximum comfort. Daylight fluorescent flags for barricades and markers also available.

For details, use **Key # SS-16** on inquiry card on page 33.



NEW BELL SIGNALS

Ease of installation, excellence of quality and performance, and economical prices are features of the new Valubel line of single stroke and vibrating bells produced by Wheelock Signals, Inc. Valubels are made for both indoor and outdoor service. All contain the same ringing mechanism that is adaptable to 4″, 6″, 8″ and 10″ bell shells. The housings are cast metal. The indoor model housing (top in picture) features an adapter plate with slots for easy attachment on standard utility outlet boxes. It can also be mounted to single and double gang plaster rings. Outdoor Valubels (bottom) are available in 6″, 8″ and 10″ sizes. They are housed in heavy cast metal condulets and sealed with weatherproof rubber gaskets. Wiring connection is made through ½″ conduit. Single stroke bells are available for AC or DC; vibrating bells on AC only. All sizes may be specified for 6, 12, 24, 48, 110 and 220 voltages.

For details, use **Key # SS-17** on inquiry card on page 33.

WRITE-ON MARKERS

E-Z-Code's self-adhering "write-on" markers and labels provide on-the-spot marking in production, safety and maintenance operations. Write-ons are used as special wire or cable markers, as an instruction, inventory, product and component marking label or for miscellaneous marking or warning requirements. Manufactured by Westline Products, they are made from fungus resistant Vari-Temp Cloth in a variety of die-cut sizes on handy dispenser cards ready for application to any clean surface. Can be removed cleanly. Absorb pen, pencil, ballpoint or typewriter.

For details, use **Key # SS-18** on inquiry card on page 33.

WATERFLOW ALARM INDICATOR

A well-planned sprinkler system will usually provide effective protection against the spread of fire, but without an automatic alarm made possible by waterflow indicators, a sprinkler head may release thousands of gallons of water before the trouble is discovered. In many instances the subsequent water damage far exceeds the fire loss.

Autocall's new WF-4 Waterflow Indicator also protects against the accidental operation of a faulty or damaged sprinkler head. The indicators are installed in the sprinkler system risers. They detect all waterflow in the pipe. To avoid false-alarms due to pressure surges in the sprinkler system, Autocall's new indicator is equipped with a pneumatic retard mechanism. This feature "absorbs" intermittent paddle activity and signals only a constant flow of water over a pre-set time. A non-critical screw adjustment sets this retard to any desired time delay.

For details, use **Key # SS-19** on inquiry card on page 33.

COMBINATION LINE MARKER

The gravity-feed Florline Marking Machine that rolls lines is now combined with a spray machine to make it a multi-duty "Two-or-One" unit for varied paint applications. It is two independent machines that may be used together or separately,

by one operator or two. The 5-gallon Florline rolls safety and parking lines with no mist hazard to cars or stock; makes lines flush to barriers and vertically up curb or wall. The companion unit is composed of a 3 H.P. piston-type Compressor and Spray Gun. It sprays curbs, posts, parking barriers, stencils and serves as a portable compressor for many other air and painting needs.

Combined, a single operator can complete both marking and spray-

ing jobs, before moving to the next area. Additional feature is a tube forward to blow surface clean ahead of roller, saving sweeping time. For two-man operation, the units are separated easily. Belt guard on spray unit was removed for photograph. Available from H. C. Sweet Co.

For details, use **Key # SS-20** on inquiry card on page 33.

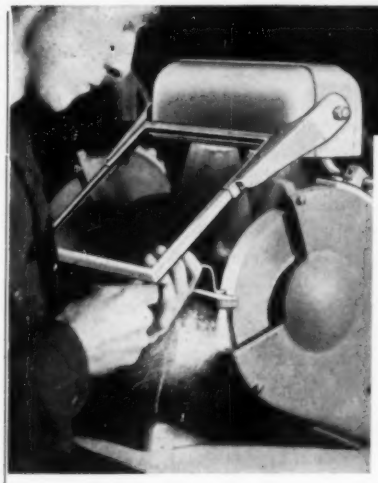
THEFT-PROOF CONE FLASHER

The new No. 610-FS Dietz Visi-Flash transistorized warning light has been designed to increase both the day and night effectiveness of cones in traffic control work. A theft-proof feature is the 30-inch

steel chain attached to the battery case cap. Placed in a traffic cone, the chain hasp is ramset to the pavement, making the cone and flasher theft-proof. A flag staff socket welded to the double-faced head permits the use of a warning flag to increase daytime effectiveness. Producing 8 beam candlepower through 4″ optical lenses, the No. 610-FS Visi-Flash signal life is 400 hours, using four ordinary "D" flashlight batteries. The signal flash lasts $\frac{1}{10}$ of a second and pulsates 65 times per minute.

Snap-out lens retaining rings simplify bulb replacement. Switch on the side of the circuit housing turns the flasher on and off. Available with red or amber lenses, from R. E. Dietz Co.

For details, use **Key # SS-21** on inquiry card on page 33.

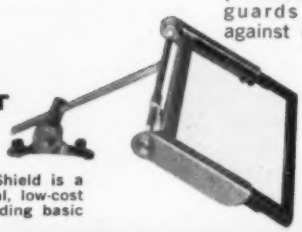


JUNKIN
ELECTRO-LOCK SHIELD

MAXIMUM visibility... MAXIMUM protection!

The Junkin Electro-Lock Shield permits the operator to see clearly the work he is performing and at the same time protects him from severe injury or eye damage. Interlocking power and light circuits will not permit the machine to operate unless the shatter-proof Junkin Electro-Lock Shield is in complete protective position. This feature guards unthinking operators against mishap.

Junkin SAF-SIGHT SHIELD



The Saf-Sight Shield is a simple, practical, low-cost means of providing basic protection.

Canadian Distributor: Levitt Safety Ltd., Toronto

Write for FREE BULLETIN

JUNKIN ENGINEERED SAFETY

JUNKIN SAFETY APPLIANCES
3121 Millers Lane, Louisville 16, Ky.

(For details, use Key # G-10 on card on page 33)

RADIO MONITOR-RECEIVER

A new design in an FM Monitor-Receiver, called the Defender, has been added to the Checker Electronics Corporation's "Rangemaster Line." A new 12-volt Hybrid Circuit gives the unit greater range and more stability and assures lower maintenance cost. This unit has a dual purpose—can be used in the car (12 volts) or used at home (A.C. with power supply). It has wide application for receiving or monitoring police calls, fire reports,

civilian personnel, security guards, construction crews, truck lines, and many other uses. It comes in two models RA-52 for Low Band and RA-150 for High Band range.

For details, use **Key # SS-22** on inquiry card on page 33.

FLUORESCENT CHANGEABLE-LETTER SIGNS

These versatile, attention-getting signboards utilize daylight-fluorescent letters which seem to glow in ordinary light. Made by W. W. Holes Mfg. Co., the Magne-Glo sign kits contain over 200 individual letters and numerals each with magnetized backing for attachment to black, lightweight, metal background-panels. Letters may be orange, yellow or green. Suggested safety uses include posting of safety slogans and safety records, as demonstration boards for safety meetings, etc.

For details, use **Key # SS-23** on inquiry card on page 33.

WET FLOOR CAUTION STAND

The danger of costly wet floor accidents can be reduced to a minimum through the use of the Caution Stand, a safety and maintenance product by Walton-March. These safety stands are highly visible, two-sided signs of tempered Masonite riveted to galvanized, non-rusting steel frames. Non-marking rubber feet prevent slipping. Used as safety warning where pedestrian safety is threatened by wet or slippery floors, or where foot traffic interferes with floor cleaning operations, the self-folding Caution Stands are fully assembled, and packaged in sets of five. Each set includes its own metal wall bracket for space-saving storage off the floor.

For details, use **Key # SS-24** on inquiry card on page 33.

MESSSAGE REPEATER

Cousino Electronics Corp. has announced an unusually versatile, heavy-duty message repeater having three kinds of operation for audio playback of pre-recorded magnetic tape loop cartridges. Known as the Mag-Matic Message Repeater, Model **MR-2321,** it is fully transistorized and requires no warm-up or stand-by. Outside dimensions are 6 x 6 x 9 inches; weight, 10 lbs. The self-threading cartridges will play from ten seconds to one hour with automatic stops between messages, or synchronized visuals. The "Shutoff" position provides start-stop operation when the unit is attached to remote starting devices such as pushbuttons, switch mats, photoelectric and capacitor switches, time clocks and other actuating devices. Audio volume is adjustable to serve all limited area applications. Suitable for point-of-use safety warnings, safety meetings, etc.

For details, use **Key # SS-25** on inquiry card on page 33.

EXIT LIGHT-ALARM

A completely automatic self-contained exit light and alarm, to guard against power failure, is offered by Infra Corp. Upon failure of normal power sources, the unit switches over to a battery source that maintains the lighted EXIT sign and blows an intermittent horn signal. This indicates the location of the exit when smoke, fire, etc., renders the sign not visible. Unit may be either shelf or wall mounted.

For details, use **Key # SS-26** on inquiry card on page 33.

HIGH-POWER TWO-WAY RADIO

New 50 watt power output Transicom 2-way mobile radio units for use in the 25–54 megacycle band are announced by the Mobile Communications Dept., Allen B. Du Mont Laboratories. The Type 125-A includes the complete transmitter/receiver, transistorized power supply, and necessary antenna. Units are compact for under-the-dash mounting and contain special 3″ x 5″ integrated speakers with audio directed to the drivers ear. Suitable for business, commercial, municipal, and emergency service users. Optional features are dual frequency transmitters and coded squelch. Weight of the units is 14 pounds.

For details, use **Key # SS-27** on inquiry card on page 33.

IMPACT RESISTANT FLASHER

New Selecto-Flash safety lights, with head-frame and translucent red lens molded of tough Tenite butyrate plastic, are effective warning devices on highway, street and industrial construction projects. Excellent impact and weather-resistant properties make these lights particularly serviceable under the abuse and exposure of outdoor usage. Manufactured by Selecto-Flash, Inc., the light is battery-powered through a transistorized circuit, has an adjustable flash frequency in either one-way, two-way or multi-directional models.

For details, use **Key # SS-28** on inquiry card on page 33.

STEEL OR WOOD BARRICADES

Two rugged, new barricades, No. 360 and No. 361 are identical, except the No. 360 features tough 18 gauge steel panels, and the No. 361 panels are made of economical ⅜″

weatherproof plywood. Panels are 12″ by 42″ and bolt rigidly to the angle steel legs using cap screws and hex nuts. Especially designed for use with Dietz Visi-Flash hazard warning lights, the barricades are finished in Federal Yellow, with alternating 6-inch wide yellow and black striping. Made by R. E. Dietz Co. On the job, the barricades stand 39 inches high, so flashes are well above the level of ordinary headlights. Off the job, the barricades fold to a compact 2¾″ width for easy storage or racking in a minimum amount of space. Other dimensions available. Brilliant, reflective "Caution" or "Danger" warning signs are available in either 5″ by 18″ or 5″ by 30″ sizes.

For details, use **Key # SS-29** on inquiry card on page 33.

REFLECTING EMERGENCY MARKER

Packaged protection against nighttime highway accidents resulting from disabled trucks, buses, and trailers is offered in a new road marker announced by Mine Safety Appliances Co. Also suitable for marking excavations, for airports, and for emergency crews, the M-S-A Signal-Lite Road Marker

features a highly reflective aluminum panel mounted by means of a spring frame on a cadmium-plated steel base. A warning flag is attached to the top of the frame. The unit will collapse undamaged if accidentally run over by a passing vehicle. Pre-production tests show it can withstand forty mile-an-hour winds without overturning or moving. The road marker has also met all Pennsylvania and I.C.C. requirements for resistance to vibration, moisture, and dust. Reflective surfaces meet standards of visibility at night.

For details, use **Key # SS-30** on inquiry card on page 33.

INDUSTRIAL WARNING HORN

A portable signalling horn has been introduced by Ferrell Mfg. Co. Powered by Liquefied Freon 12 in a disposable Energy Pak, these self-contained units require no outside power source. The all-metal horns are painted a safety yellow color with corrosion-resistant enamel. Available with either push button operation or thumb lever action. The Energy Pak, capable of producing 800 strong, clear blasts, is safety-fused, will not explode, is I.C.C. safety-approved and certified by the Bureau of Explosives. Applications include signals between work crews, plant watchmen, patrolling guards, emergency warnings. Especially valuable around combustible materials in such industries as chemical, petroleum and grain.

For details, use **Key # SS-31** on inquiry card on page 33.

CUT Costly Accidents with S. M.

SAFETY MAINTENANCE MAGAZINE

for better safety programming!

S.M. . . . first and foremost in the field of industrial accident prevention, fire control, maintenance and hygiene. Its top editorial content gives current news and views to help you. . . .

- ✔ REDUCE ACCIDENT RATES
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It also places at your disposal—through reader inquiry service—the complete facilities of our Safety Division which provides the answers to any safety problems you may have—*at no additional cost.*

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N. D. Simmons

Appointment by Canadian Industrial Safety Assoc.

J. A. Fletcher, President of the Canadian Industrial Safety Association, announces the appointment of Norman D. Simmons, B.Sc., to the newly created permanent post of Executive Director.

Mr. Simmons, who was born in Ottawa, is a graduate of Queens University in Mechanical Engineering, and also later studied Basic Accounting, Industrial Organization and Management at Carlton College, Ottawa. His industrial connections include: National Research Council, the Bureau of Mines, Ottawa, Rogers-Majestic Corporation Ltd., and Canadian Westinghouse Company, Ltd., as electronics representative on government liaison, and as Manager-Product Sales, Defense Apparatus Division.

The Canadian Industrial Safety Association was formed about eight years ago, and will be able to furnish statistical information on accident costs, severity and frequency rates, and compensation costs and provide many safety services throughout Canada, embracing every type of industrial activity, including manufacturing plants, mines, mills, utilities, refineries, lumbering, etc. Offices are located at Terminal Warehouse Building, 207 Queen's Quay West, Toronto 1.

Calamity Near Home

Charity and calamity both begin at home.

A survey of accident records by traffic engineers of Liberty Mutual Insurance Company has revealed that eight out of every 10 traffic accidents occur within 25 miles of the drivers' homes.

"Familiar streets aren't necessarily the safest," a company engineer said. "Motorists do most of their driving close to home. It falls into a pattern; they get careless or take chances and wind up saying 'if only'."

This happens so often—over 10,000,000 times last year—that Liberty Mutual safety authorities have coined the term "If-Only" drivers for motorists involved in accidents. This, they say, is because the majority of all accidents might have been avoided "if only" motorists hadn't become careless and courted calamity near home.

"You told me how careful you were when I hired you. Now tell me all over again; I'm getting discouraged."

Southeast Show

(from page 14)

of the State College School of Engineering, Raleigh, will be chairman of the seminar.

John Harden Associates, of Greensboro and Raleigh, will again produce the show, with Robert E. Zimmerman as show manager.

"The show and seminar will offer a dual program of broad interest to all sections of business and industry," Zimmerman said, "and of special interest to building and plant maintenance engineers."

The show is expected to draw more than 10,000. Admission will be free, but registration is required. A large array of maintenance and engineering equipment will be displayed by some 200 exhibitors.

Products and services will be shown under simulated operating conditions, including building materials, electrical equipment, heating, ventilating, air conditioning, lubricants and lubricating equipment, maintenance tools and supplies, paints and painting equipment, product finishes, and power transmission equipment. Two sections of the show devoted to welding and materials handling are expected to draw wide attention.

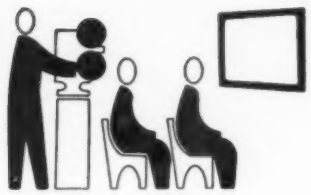
President Kennedy Calls Safety Meeting

President John F. Kennedy set March 6–8, 1962, as the dates for the next biennial meeting of the President's Conference on Occupational Safety. He named Secretary of Labor Arthur J. Goldberg as General Chairman of the Conference.

In calling the Conference, the President said:

"The purpose of the 1962 Safety Conference will be to re-energize and expand our efforts to reduce on-the-job deaths and injuries. Despite more than a generation of organized safety work, 13,800 workers were killed last year in job accidents. There were also nearly 2 million disabling injuries. This toll must be reduced. Since new technology constantly changes methods of work, we must continuously improve our safety techniques to keep pace with rapid industrial progress. This is the challenge which will face the President's Conference on Occupational Safety when it meets next year."

The first Conference was called in 1948 by President Truman. More than 3,000 leaders of American business, labor, government, education, insurance and private safety organizations are expected to attend the 1962 meeting next March. The Department of Labor's Bureau of Labor Standards will serve as secretariat for the Conference.



Safety on Film

Home Fire Quiz Film

A motion picture quiz that lets viewers compete with firemen in spotting home fire hazards is featured in a fire safety film premiered at the 65th annual meeting of the National Fire Protection Association.

The 20-minute movie, "Fireman At Your Door," was produced by Aetna Casualty and Surety Company in an effort to promote voluntary home inspection programs through which firemen seek to discover and eliminate potential fire dangers.

Filmed principally in Rockford, Ill., where fire losses were cut more than 50 percent after the home inspection program was begun, the movie follows Rockford firemen on a series of hazard hunting tours. Shown the same things the inspecting fireman sees, the audience gets a chance to compare its fire prevention recommendations with his in 21 typical home situations.

"Fireman At Your Door," portions of which are narrated by Henry G. Thomas, a past president of the International Association of Fire Chiefs, and retired Hartford, Conn., chief, will be nationally distributed by Aetna Casualty for free-loan showings by community organizations, schools and churches. Write to the company at Hartford, Conn.

Science of Fire

Completion of a new educational film entitled, "The Science of Fire," has been announced by the National Board of Fire Underwriters. The film tells the story of fire, the principles of combustion, and how fires can be prevented. It covers flash points, ignition temperatures, vapor travel, and methods of extinguishment.

The film, in 16 mm. color, runs 20 minutes. It has been cleared for television showings. The producer was MPO Productions, Inc., New York. The film may be obtained on free loan by writing to the Bureau of Communication Research, Inc., 267 West 25 Street, New York 1, N. Y.

Work Training & Simplification Film

Eighty-eight keys to American work simplification and industrial engineering techniques are provided in the 1961 edition of the Industrial Management Society film rental catalog.

Produced by leading American companies and universities, these films all have won awards in the annual Methods Improvement Competition sponsored by the Society. The folder explains the terms covering the rental of these 16mm films.

The films are approximately 10 to 15 minutes long in running time and picture "on-the-job" training and work simplification projects in both plant and office operations.

Copies of the brochure are available by writing the Industrial Management Society, 330 South Wells Street, Chicago 6, Illinois. There is no charge for the booklet.

16mm Industrial Safety Films

IT'S IN THE CARDS (18 min.)

". . . deals with the problem of . . . carelessness and chance taking . . . the film is so excellent . . . that it's highly recommended as a supplement and attitude builder in any program."

Association of Casualty & Surety Companies

IT DIDN'T HAVE TO HAPPEN (13 min.)

". . . deals with . . . familiar personal attitudes which are responsible for either safety or tragedy . . . the film has impact and suspense; it is an excellent job."

Association of Casualty & Surety Companies

"In our estimation this is the most excellent film we have ever seen on safety."

Swivelier Company, New York

For a complete list of 16mm sound Industrial Safety Films write or telephone

International Film Bureau Inc.
332 S. Michigan Ave.
Chicago 4, Ill. HArrison 7-4546

(For details, use Key # G-11 on card, page 33)

Fire Fighting Film

Every John Bean fire fighter—including high pressure fog and volume units, 65- and 75-foot aerials, squad and rescue equipment, Class "A" triple combination pumpers, tankers and various types of special purpose equipment—is briefed in a new, 16 mm. full color, sound movie produced by John Bean Division of Food Machinery & Chemical Corp.

A dramatic segment of the film shows student firemen attacking and extinguishing mock oil fires and blazes in wooden structures with true high pressure fog at the fire school conducted year around by John Bean.

The film is available on a loan basis for showings to municipal, volunteer and industrial fire brigades. For scheduling, groups may contact the Fire Fighter Department, John Bean Division, Food Machinery & Chemical Corp., Lansing 4, Mich.

inside the trade

The appointment of *Bruce R. Wellek* as assistant director, advertising and public relations for *THE MASTER BUILDERS CO.*, was announced by Stephen W. Benedict, president. Wellek, who will work in the preparation of technical literature, was technical writer in the Structural and Railways Bureau of the Portland Cement Association for over five years. Previous to that he was assistant editor of "Modern Concrete" and "Pit and Quarry" magazines.

Willson Products, Div. of *Ray-O-Vac*, announces the appointment of *Arthur J. Karstaedt, Jr.*, as Sales Promotion Manager. He will develop and coordinate Willson's national advertising and sales promotion programs. Also serving as chairman of the Plan Board—national distributor advisory council whose purpose it is to add field knowledge to Willson safety equipment and promotions, he most recently was recommended for his initiative in developing Willson's national safety clinics—distributor training schools. A graduate of the University of Wisconsin's School of Journalism, Mr. Karstaedt joined Ray-O-Vac as assistant to the industrial relations manager in 1949 and was later made manager of the company's Customer Service activities.

Willson Products has also announced that *Richardson Supply Co.*, 814 West 17th St., Kansas City, Mo. has been appointed the franchise distributor in the Kansas City area. *Lewis Richardson* has established the supply company as successor to the L. R. Stone Co., a safety equipment business founded by the late Mr. Stone in 1925. The distributor will handle safety clothing, fire equipment and other lines as well as Willson head, eye, respiratory and hearing safety products.

ERIE CITY IRON WORKS, Erie, Pa. has acquired the exclusive rights to manufacture the power-operated "Safety-Lok" Autoclave Door from *Electroweld Mfg. Corp.* Mr. George Lada, formerly Chief Engineer of the "Safety-Lok" Division of Electroweld, has joined the engineering staff of Erie City Iron Works.

Purchase by *Sierra Electric Corp.*, Gardena, Calif., of all rights, inventories and tooling for the low-voltage electrical control system currently produced by the *Square D. Co.* has been announced by Lee T. Bordner, Sierra's President. The transaction adds materially to the rapidly expanding Sierra Line of electrical wiring and control devices for residential, commercial and institutional application. All engineering and manufacturing equipment for the low-voltage control system is being moved from the Square D facility at Cedar Rapids, Iowa to the Sierra factory at Gardena.

GENERAL BANDAGES, INC., manufacturer of cohesive medical and protective bandages, is celebrating its 25th anniversary. Founded in Chicago by J. A. Hinkamp, the company has grown rapidly, requiring a move in 1957 to a spacious modern plant in Morton Grove, Ill.

Truman Young

Truman Young has been named Director, Advertising and Public Relations, *WALTER KIDDE & COMPANY, INC.*, Belleville, N. J., according to an announcement by John F. Kidde, president. In his new position, Mr. Young will be responsible for the coordination of the promotional programs for all divisions of the company in the fields of aero-space, electronics, industrial, marine, international, ultrasonic and detection alarms and for its Canadian subsidiary. Mr. Young joined the company in 1954 and has served as Manager of Market Development, Industrial and Marine Division, and Advertising and Sales Promotion Manager.

Maurice Bick has been elected president of *FIDELITY CHEMICAL PRODUCTS CORP.*, Newark, N. J. Mr. Bick, former general manager, will direct the expansion and acquisition program of the company, which manufactures electronic chemicals, metal cleaners, coatings, safety solvents and other specialties.

CAMPBELL CHAIN CO., York, Pa., has announced the appointment of *Donald Luehrs* as Territory Manager for the Commercial, Industrial and Automotive Sales Division in the Cleveland area. He was previously employed in sales by Akron Laminating Co. and as warehouse manager for Jones & Laughlin in Pittsburgh.

Raymond H. Deemer's appointment as sales-service representative of *MASTER BUILDERS CO.* Dayton territory was announced by Stephen W. Benedict, president. With the company from 1951 to 1955, he had previously been employed by the Neville Concrete Pipe Company of Pittsburgh.

Mr. Benedict has also announced *John P. Draney's* appointment as sales engineer, Chicago Branch Office. Draney was previously employed by the Material Service Corporation and by Naess and Murphy.

Gordon P. Larson, Executive Vice-President of *OXY-CATALYST, INC.*, has announced the formation of an Industrial Department, responsible for the marketing of all industrial Oxy-Catalyst products.

C. T. Hayes, former Sales Manager for industrial catalysts, has been made Manager of the new Industrial Department. He is a graduate of Drexel Institute and has been with Oxy-Catalyst in various engineering and sales positions since 1951.

CHICAGO EYE SHIELD CO., a leading manufacturer of industrial safety protective equipment, has announced a new sales and distribution policy established for welding equipment distributors exclusively. Prompted by the steady growth of its welding equipment line, the company says the policy assures welding equipment distributors that they can resell Cesco welding products at strictly competitive prices.

Robert C. Tyo, president of *DEWALT, INC.*, has announced the appointment of *Manuel V. Nodar* as product manager of the stationary power tools recently obtained from The Atlas Press Company and now sold under the DeWalt brand. Before joining DeWalt, Mr. Nodar was associated with the Porter-Cable Machine Co., for eight years as director of advertising and sales promotion. From 1950 to 1953, he was an advertising executive with Bausch and Lomb, Rochester, N. Y.

To serve the needs of sling chain users in the Midwest area, *American Chain Division of AMERICAN CHAIN & CABLE CO., INC.*, recently put into operation at 2040 North Hawthorne Ave., Melrose Park, Ill., complete facilities for the assembly of their full line of ACCO

Registered and Kuplex sling chains and other chain assemblies, and the servicing and reconditioning of sling chains already in use. The new factory facilities at Melrose Park are manned by experienced personnel and are equipped for welding, heat-treating, inspection, proof testing, tensile testing, and hardness testing operations. A certificate of test is furnished with each new or reconditioned sling chain. For slings to be reconditioned immediate pick-up and prompt return will be arranged.

SWARTWOUT FABRICATORS, INC., of Kokomo, Ind., manufacturers of ventilation equipment, announced the appointment of three new sales representative firms to handle the complete Swartwout line. According to Robert Parshall, Swartwout Sales Manager, the new firms are: *Hayden & Company* of Chicago for the northwestern Indiana and northeastern Illinois territory; *Tennity & Co.* of Los Angeles for Southern California; *Stone Heating & Ventilating Company* of Washington, D. C., for the District territory.

A "Building Maintenance Product Show" on wheels has been created by the Service Products Division of *JOHNSON'S WAX*. The mobile show is contained in a giant trailer fully equipped with modern visual aids to tell the story of the development and quality control of Johnson's building maintenance products, said Thomas L. Fitzgerald, field sales manager for service products. The trailer is scheduled initially for a limited area in the Midwest, where it will be made available to Johnson's distributors.

E. L. Bruce has been appointed Sales Manager at *JOHNSON-WILLIAMS, INC.*, of Palo Alto, California, consulting engineers and manufacturers of combustible gas detectors and alarm systems, according to P. L. Williams, General Manager. Mr. Bruce joined Johnson-Williams in 1959. He formerly was District Manager for C. F. Braun & Company, San Francisco.

Two new manufacturers' representatives have been named by the *Armstrong Cork Co.* for the company's new line of commercial and institutional flooring maintenance products. They are: *The R. O. Demlow Co.*, Memphis, and *Pat Roth*, Fort Thomas, Kentucky. Individual firms are being chosen based on their facilities and background to handle the specialized requirements of the commercial and institutional building market.

Shipment schedules have been maintained by the *Falcon Alarm Co., Inc.* in spite of the smoke and water damage from a fire early Sunday morning, May 14, that broke out in a refrigeration and air conditioner repair shop occupying a portion of the ground floor. There was no evidence of any fire or heat damage to Falcon stock or equipment and undoubtedly the automatic alarms contributed to minimizing the damage to the other parts of the building and contents.

The management of Falcon wishes to express thanks for the calls, letters, and telegrams that have poured in from competitors, suppliers, customers, and friends offering all types of assistance and sympathy.

Safety Appointments

Sherman E. Stecker has joined Caloric Appliance Corp. as Safety Director at the company's Topton, Pa., plant, it was announced by Robert Klein, Vice President of Manufacturing. In the newly-created post, Stecker will be responsible for administration of the gas appliance firm's safety program. Before joining Caloric, Stecker had been associated with Tung-Sol Electric Inc., Washington, N. J., in their Personnel Department. He is a graduate of Lafayette College.

Robert E. Outman, Jr. has been appointed as Safety Engineer for Commercial Credit Corp. A spokesman for the Company said: "The corporation has hundreds of cars being driven by employees. It is imperative that we supplement the work of our various safety committees with a trained safety engineer who can devote his entire time and energy to the development of a program that will achieve a reduction in the amount of time and money lost through accidents."

Mr. Outman graduated from Middlebury College. He has had many years' experience in the automobile and insurance industries, and before assuming his present duty he was Manager of the Philadelphia district for Calvert Fire Insurance Company.

Clyde R. Rich, safety engineer of the Middletown Works of Armco Steel Corp., has been elected president of the Ohio Society of Safety Engineers at a recent meeting held concurrently with the All-Ohio Safety Congress. Rich formerly served as vice president and secretary of the society. The organization was formed in 1916 to promote the science of accident prevention and the conservation of life and property.

Jack G. Maize, Safety Director of the U. S. Army Signal Engineering Agency, has been elected Chairman of the Potomac Area Safety Council which embraces more than 70 federal agencies in the metropolitan Washington Area. Mr. Maize had served the organization as chairman of a 56-member group to develop a program of off-the-job accident prevention.

R. M. Manifold, Safety Director, Arlington Hall Station, has been named the new chairman of this special committee. Mr. Maize indicated the major effort of his administration will be to implement this far-reaching program.

Immediate past chairman of the council was *Larry A. McGraw*, Safety Director, The Engineer Center & Fort Belvoir.

Howard Riefenstahl, manager of safety and training for Alpha Portland Cement Co., has been appointed chairman of the Portland Cement Association's Accident Prevention Committee by H. A. Sawyer, PCA board chairman, for a 2-year term. Mr. Riefenstahl will participate in safety projects with 51 committee members representing 178 cement plants. The committee will conduct regional safety meetings, issue a safety publication, and recommend improved safety training methods.

TULITO

SAFETY CLAMP

(Patented. Other Patents Pending)

LOCKS INSTANTLY!

Absolute Safety Assured

Forget the dangers of high climbing ...use TULITO SAFETY CLAMPS. Thousands are now in use on every type of structure.

FULLY APPROVED BY INDUSTRIAL COMMISSIONERS AND SAFETY ENGINEERS.

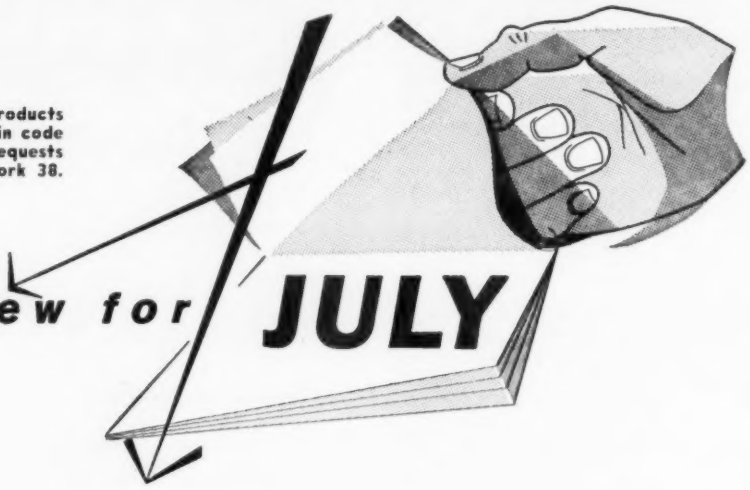
MEYER MACHINE, INC.

Red Wing, Minnesota

(For details, use Key # G-12 on card, page 33)

Material appearing in this section is published as information and is not intended to imply endorsement or guarantee by this publication.

To obtain descriptive literature of products listed, use Reader's Inquiry Card. Write in code number given each item. Send written requests to: Service Dept., 75 Fulton St., New York 38.



what's new for JULY

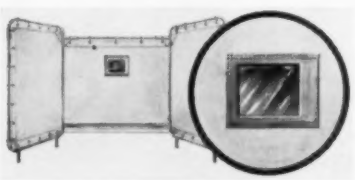
NEW COATING SIMPLIFIES FLOOR MAINTENANCE

(Use Key # 668 on Inquiry Card on page 33)

EXTENSIVE laboratory and in-field tests indicate that First Coat, a new product of Masury-Young Company, makes safer, more attractive floors under all traffic conditions, and all for far fewer maintenance dollars. A water-emulsion based primer, First Coat is easily applied with mops, and forms a hard colorless film which fills the pores of composition floors. Unlike sealers, it does not oxidize, will never yellow or discolor in any way, and does not require removal. It also serves as a barrier between the chemical action of composition floors and the dressings and cleaners used on them. Tests on old and new resilient floors in office buildings, plants, schools, hospitals and institutions showed First Coat sharply reduced floor slipperiness, and eliminated or minimized cleaning difficulty, excess scuffing, powdering of resin dressings, poor gloss, abbreviated dressing life, high labor costs, multiple floor care products.

The manufacturer recommends First Coat for asphalt tile, vinyl, vinyl asbestos, linoleum, rubber tile and terrazzo. Regular subsequent cleaning and redressing of floors will not remove the underlying coating. It is semi-permanent, but can be removed, with concentrated cleaner solutions and scrubbing pads. On porous floors, it seals the pores, and on tiles it serves as a barrier between tile and dressing. It is easily applied with a clean string mop. One coat is usually sufficient, but for exceptionally worn or porous floors, a second coat may be applied after half an hour.

Daily sweepings with specially treated dust mops keep the surface polished and free of dust. Slightly soiled floors need only damp-mopping with cold water. Under normal conditions, with proper cleaning and dressing, there should be no need to replace First Coat.



WINDOWED WELDING SCREENS

(Use Key # 669 on Inquiry Card on page 33)

A GLASS welding plate now solves the problem of viewing the welding operation safely. Can be used to good advantage for inspection or checking, for training purposes or when visitors arrive. The plate itself is filter shade #10 and is easily removed from its leather reinforced pocket. Recommended when ordering Singer Glove Mfg. Co. screens 6 ft. to 8 ft. high in either the triple or 4-sided models.

RADAR WAVE MONITOR

(Use Key # 670 on Inquiry Card on page 33)

FOR WORKERS at radar installations and radar manufacturing plants across the country, an instrument to solve a radar safety problem has been developed by Radar Measurements Corp. The densiometer monitors the energy radiated from transmitters and antennas to warn when the power level is potentially dangerous to personnel. Powered by batteries and built for one-hand operation, it can easily be used by non-technical workers. A simple scale, marked out in red and green areas, shows the operator unsafe and safe levels. It was developed to meet the needs of laboratories, radar manufacturers and radar transmitting installations for an accurate yet small and portable means for safeguarding personnel against accidental exposure to damaging radiations. The operator simply faces the instrument's antenna toward the source of radiation. Readings are shown as levels above 10 milliwatts per square centimeter. It is supplied with five antennas to cover the entire range of frequencies from 200 to 10,000 megacycles.

JUMBO EYE-SHIELD GOGGLES

(Use Key # 671 on Inquiry Card on page 33)

LIGHTWEIGHT safety goggles molded of tough Tenite butyrate plastic offer maximum protection wherever flying particles or objects are a hazard to the eyes. Resistant to impact and to scratches, the one-piece butyrate goggles also have high optical clarity which affords undistorted vision. Ventilation holes on the sides prevent fogging, thus creating greater wearing comfort. Available in clear or green plastic, the goggles, which meet U. S. government specifications, are held snugly to the face by elasticized fabric and fit comfortably over prescription glasses of any size. Available from Eastern Safety Equipment Co.

I.C.C.-APPROVED PLASTIC CARBOY

(Use Key # 672 on Inquiry Card on page 33)

A REVOLUTIONARY new all-plastic carboy that needs no overpack is announced by Plastineers, Inc. The 15-gallon capacity carboy is the first to be awarded I.C.C. authorization to ship regulated chemicals without overpack. Made from a copolymer of polyethylene, the carboy is injection-molded in two parts, then welded together by a patented process. Designed to be safe under the most adverse conditions, it has exceptional impact strength at low temperatures, and is heavily reinforced at the center and ends. It can be easily rolled and stacked. Outside dimensions are 17¼ inches diameter and 20½ inches length. Empty weight is 17 lbs. A standard polyethylene chemical pump can be used with it.

The new carboy has passed all required tests of the Bureau of Explosives, Assoc. of American Railroads and The Manufacturing Chemists' Assoc. Each unit is individually air-tested under water before shipment. Carbon black is added to the copolymer of polyethylene to provide color and prevent ultra-violet degradation.

NEW PROGRAM SIMPLIFIES SAFETY INCENTIVE AWARDS

(Use Key # 673 on Inquiry Card on page 33)

AN AWARD service program featuring the delivery of safety awards to the employees' homes is announced by M. Sickles & Sons, specialists in safety incentive plans. By mailing the merchandise awards to the employees' homes directly from the immediate plant location, safety departments will achieve savings in time and money, quicker delivery, and almost complete elimination of damage. The new Sickles plan also relieves the safety departments of most of the detail work. The plant selects the prizes from a very large collection of merchandise awards in an appropriate price range. Samples are provided for display, as shown in the picture. Employees' names, addresses and selections are reproduced on shipping labels. The awards are prepared for shipping and transported to the post office in plant's community for local parcel post delivery. M. Sickles & Sons is well prepared to work out individual details and types of programs suited to each customer.

RESCUE BREATHING KIT

(Use Key # 674 on Inquiry Card on page 33)

THE American Optical Company's Safety Products Division has started distribution of Ambu, a light, rugged, portable rescue-breathing kit. Designed to open with a flick of the wrist, the compact kit contains a resuscitator to give air and start breathing again, and a foot-operated suction pump to clear the breathing passages fast. As a supplement to the approved mouth-to-mouth rescue breathing technique, the kit can be taken anywhere and can be put to work instantly by one person because it requires no electricity or other connections. The foot-operated pump clears the mouth and throat of blood, mucous, vomitus or other liquid quickly.

The Ambu resuscitator bag holds 1,000 cubic centimeters of normal atmospheric air and will deliver up to 700 cubic centimeters into the lungs when squeezed. This is usually more than can be delivered by mouth-to-mouth breathing but less than an adult's lungs hold so there is no danger of rupturing tissues.

HIGH-RATED EXTINGUISHER

(Use Key # 675 on Inquiry Card on page 33)

A NEW, low-priced 2½-pound dry chemical fire extinguisher has been introduced by Walter Kidde & Company, Inc. The pressurized Kidde Kompact has a UL rating of 4-B:C, for extinguishers of its capacity. The unit features fast, self-evident operation. When it is picked up by the carrying handle, the safety lock automatically releases; then simply aim the nozzle at the base of flame and press discharge lever. After use, simply unscrew and throw away the empty powder container and replace with a new, pressurized cylinder. Unit is 14" high, 3" in diameter and charged weighs 5 pounds. It comes with a fast release, firm grip clamping band bracket which releases with the pull of a finger.

BRUSH-ON NON-SLIP COATING

(Use Key # 676 on Inquiry Card on page 33)

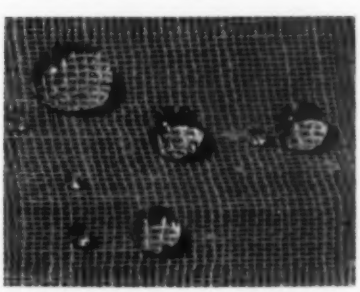
AKROS Non-Slip Walkway Coating, a special, easily applied finish, originally developed by The Akron Paint & Varnish Co., to reduce the hazards of wet, slippery ship decks, is now available for general distribution. Applied with a brush, like

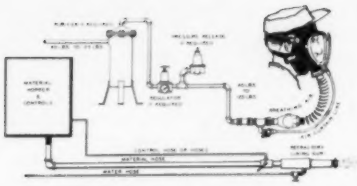
ordinary paint, the finish is available in two formulas. Type 1 produces a surface rougher than paint with good non-slip properties. Type 2 includes an abrasive for added security. Both types are available in white and colors, in quarts, gallon and 5 gallon pails. Suitable for cat walks on pipelines (see picture), factory structures and tank trucks; at truck docks; for truck and equipment step plates; on stairs, walks, shower stall floors, etc.

SILICONED ALUMINUM ROOF COAT

(Use Key # 677 on Inquiry Card on page 33)

THE CHEMICAL introduction of silicones into Asbestolite Aluminum Roof Coating now produces complete waterproof roof protection, it is announced by The Monroe Company, Inc. The addition of silicones increase the natural water and weather-resistance of its penetrating oils and Alcoa aluminum flakes and form a temperature barrier to stop the deteriorating effects of extreme temperature changes. The coating will not crack or alligator, but will remain resilient for years, it is said.





AIR CURTAIN KEEPS MASK LENS CLEAN

(Use Key # 678 on Inquiry Card on page 33)

A NEW application of the old air curtain idea has been applied to the foundry industry. Acme Protection Equipment Co. announces its Curtain Air Mask for Cupola Liners who operate refractory placement guns for daily lining jobs. The Curtain Air attachment on the outside of the Acme ZephyrAir Mask supplies a controlled flow of air near the lenses. This captures and carries away all but the heavier "gobs" of wet refractory mud that spatters off walls of cupolas during a relining job. The lenses remain practically clear during an entire unloading of the material hopper. The operator is meanwhile effortlessly breathing good air—not silica loaded air. The ability to see better makes possible a better job. The proper consistency and thickness of lining means less bridging of tuyeres and consequently reduces the cost of molten metal.

Outfit consists of the Acme ZephyrAir Mask fitted with the Curtain Air attachments, the required hose, guages, safety popoff, regulator and filters.

SELF-ADHESIVE INSULATING FOAM

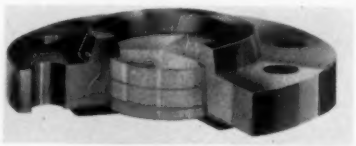
(Use Key # 679 on Inquiry Card on page 33)

FLEXIBLE urethane foam with self-adhesive backing is now being offered by Air-O-Plastik Corp. for a wide variety of cushioning, insulating, and sealing applications. The material, after removal of its paper backing, adheres firmly to any clean, dry surface and is unaffected by repeated flexing and compression, dampens vibration, absorbs sound, and resists water, oils, chemicals, rot, fungus, mildew, and termites. Applications include weather stripping, gasketing, case liners, dust seals, sound deadeners, and insulation.

NONCOMBUSTIBLE LUBRICANT

(Use Key # 680 on Inquiry Card on page 33)

BEL-RAY Company, Inc. has announced the availability of a radically new grease that is guaranteed not to burn. The new product, Belco No-Flame Grease, fully field-tested under heavy loads, will not carbonize, corrode, or melt. The unique qualities that are built into this non-flammable grease provide full lubricity and safety, according to the manufacturer.



SAFETY SIGHT GLASS

(Use Key # 681 on Inquiry Card on page 33)

CYCLOPS Safety Sight Glasses, made by Cyclops Industries, feature a simplified mounting assembly design for high pressure and temperature applications. They consist of only two basic components: the laminated lens which is securely bonded in the lens holder as one integral unit, and the flanged mounting body. Lens packing, adjustment screws, and adjustment rings have all been eliminated and with them lens failures caused by improper tightening. The Cyclops lens has two tempered-glass pressure disks, each with the full rated flange pressure so that if one disk breaks, the other stays in operation. A third disk shields the two pressure disks from chemical attack.

The units can be installed for most vapor and liquid service within the limits of the lens mounting materials selected; to temperatures exceeding 550°F; from full vacuum to the standard rated working pressure of the flange series. Specially designed heated, vented, welding and liquid flushed types are available.

DISPOSABLE PLASTIC APRON

(Use Key # 682 on Inquiry Card on page 33)

A NEW, longer disposable white plastic apron is offered by Busse Plastics Co. Waist and bib ties are attached to this lightweight apron of opaque white Impervite vinyl with linen like embossing to retard the flow of drippings. The new, larger size 27" x 42" is offered for shopworkers, lab technicians, nurses, butchers and food handlers. The material resists water and chemicals, soiling and staining. A quick wipe makes it reuseable. The apron is low cost, comfortable, attractive and sanitary in appearance.

WAX-PLUS-POLYMER FINISH

(Use Key # 683 on Inquiry Card on page 33)

A NEW floor product combining the advantages of both waxes and polymers is announced by the Service Products Division of Johnson's Wax. The new "Waxtra!", an extra-tough floor finish, provides the durability, safety and scuff resistance of its polymers in combination with the high gloss, restorability, and water and dirt resistance of its natural waxes. It can reduce intermediate maintenance, when used to patch worn areas without refinishing a whole floor. Available in 5-, 12-, 30- and 55-gallon containers.

TEMPLE MOUNTED SIDE SHIELDS

(Use Key # 684 on Inquiry Card on page 33)

A NEW plastic side shield, permanently attached to temples, is now available for Fendall Multi-Fit bridge safety glasses. These provide side and increased frontal protection while adding a mere 14/100 oz. to total weight. Shield design permits temples to fold flat when glasses are not in use. Clear shields or green shields for glare reduction are available. Either type also obtainable on cable type temples.

ROUGH WALL AIR-CLEANER

(Use Key # 685 on Inquiry Card on page 33)

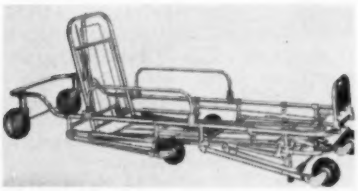
A NEW "brush type" trowel for cleaning of very rough surfaces, which is attachable to the Wall-O-Matic air pressure type Wall Cleaning machine, has been announced by Central States Maintenance,

Inc. The new trowel provides quicker, more thorough cleaning of rough surfaces such as painted cinder blocks, concrete blocks, bricks, sandfloat plaster, thrown plaster, pre-cast cement slabs and all other type masonry walls and ceilings. It features a strong, durable bristle which gets into the smallest crevices of rough and uneven surfaces. A convenient thumb control valve on the trowel emits a cleaning solution "fog spray." A light scrubbing action of the trowel completes the efficient cleaning action. The "Rough Surface" trowel can replace the "terry cloth" type trowel for cleaning of smooth or flat surface walls and ceilings.

GAS MASK CANISTER IMPROVED

(Use Key # 686 on Inquiry Card on page 33)

A LARGE increase in moisture tolerance of its specially designed All Service gas mask canisters has been reported by Mine Safety Appliances Co. A new, extremely effective desiccant and an improved Hopcalite—or specifically prepared catalyst—made a 225 percent increase in moisture tolerance through a wider range of temperatures. Generally, the canisters should provide at least twice as much service life. They are used with the All-Service mask which protects against smoke, poisonous industrial gases, and fumes, including carbon monoxide.



LOW AMBULANCE COT

(Use Key # 687 on Inquiry Card on page 33)

A NEW, one-man operated ambulance cot that lets patients ride in full sitting position in headroom less than 35" has been introduced by the Ferno Mfg. Co. Maximum headroom is gained by designing the Model 27 with a unique recessed bed, whose bottom is just two inches from the floor of the ambulance, cradled by the cot frame and wheels. One man can load and unload patients without any lifting. The front wheels are car-floor height. As the cot is pushed into the car, the front legs fold up. After the cot's center of gravity is inside the car, the back legs fold up, allowing the cot to glide into the car. With a new telescoping handle, operator can push the cot the last few feet without bending over the car bumpers.

Made of strong, tubular aluminum. The Model 27 fits all standard cot fasteners. The backrest adjusts to five positions. Turned up foot prevents the mattress from slipping. Side arms fold down for easy patient transfer. Optional equipment includes safety belts, a wide range of mattresses and covers, and floor cups for rear posts. Length is 75", width 24", height 31".

ADJUSTABLE SUCTION TUBE FOR DUST COLLECTORS

(Use Key # 688 on Inquiry Card on page 33)

A NEW, fully adjustable suction tube assembly for unit-type industrial dust collectors eliminates need for expensive permanent ductwork and increases efficient use of cabinet cloth filter collectors, according to Torit Mfg. Co. The tube consists of a flexible, tough fabric hose supported by sturdy, lightweight pivoting arms. Available in 3-inch and 4-inch hose diameters, the tube assembly rotates through 360 degrees and has an up-and-down travel of nearly 8 feet. Easily positioned, the dust nozzle remains fixed without manual adjustments. One collector with the suction tube can handle a number of intermittently operating dust producing machines or it can be used on traveling work.

TREATMENT FOR POISON IVY

(Use Key # 689 on Inquiry Card on page 33)

A PRODUCT developed by the E. D. Bullard Co. for the treatment and relief of poison ivy, oak and sumac is called Bullard's Formula with Hectorite. It is designed to combat the itching and thereby eliminate spreading and possible infection.

The severity of reaction to the poison ivy (or Rhus) family of plants varies with the individual. If swelling is extreme and spreads over much of the body area, it is wise to consult a physician. Bullard's FORMULA provides cooling relief from itching, and at the same time forms a protective film to dry up blisters. Free of all irritating chemicals, it may be applied around the eyes, if necessary. Flesh-colored, it blends with the skin and is easily removed with warm water. Packaged in 1-oz. non-breakable plastic bottles, three to a double Unit Pack. Units are individually wrapped in Polyethylene.

NEW CLIMBING SYSTEM

(Use Key # 690 on Inquiry Card on page 33)

MEYER Machine, Inc. announces a new climbing system called the Tulito Safety Climber. It provides horizontal as well as vertical travel on buildings, towers, tanks, etc. The manufacturer says a workman can actually walk up or down, or move from one side to another, at will with complete freedom to work.

The new climbing system consists of two climber shoes and a Tulito Safety clamp which are attached to two cables. These cables are suspended from a movable trolley that permits the horizontal movement. The trolley guides on a T-iron plate permanently installed on the structure. The climber shoe is an adaptation of the Safety Clamp principle. When weight is applied to the climber shoe, the device locks instantly to the cable. Release the weight and the climber shoe slides up easily. Workman climbs by alternating left and right foot.

EXPENDABLE SALT-TABLET DISPENSERS

(Use Key # 691 on Inquiry Card on page 33)

IMPREGNATED, controlled-action salt tablets in expendable plastic dispensers featuring a special Air-lock which locks out moisture and fumes, even while a tablet is being dispensed, are offered by Medical Supply Co. Made of transparent plastic, it allows a quick visual check on the supply. Available in 500 and 1,000-tablet size. Both can be mounted on plant and office walls as well as on trucks and other field equipment.

EAR PROTECTORS FOR SAFETY CAPS

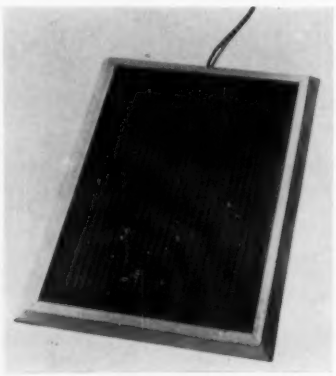
(Use Key # 692 on Inquiry Card on page 33)

DAVID CLARK CO., manufacturers of Straightaway Ear Protectors, introduces its latest model, the 372-26K. It integrates quickly and easily into most safety caps. This new model ear protector kit (pictured above on a Bullard Cap) includes the fittings necessary to attach the domes to a cap. It has been tested and approved for use in harmful noise areas of missile sites, rocket testing, aviation, construction, pulpwood, metalworking and other industries where a noise problem exists and a safety cap is required. Attenuation is kept at a high level. The 372-26K affords excellent protection with maximum comfort. Communications model also available. (Safety cap not included.)

CONTROLLING SWITCH-MAT

(Use Key # 693 on Inquiry Card on page 33)

TAPESWITCH Corp. of America announces its new heavy duty switching carpet, designated as style C R P, for machine safety, door controls and signals and alarms of all kinds. Patented sealed flat switching elements are placed between rigid fibrous sheets. Molded "ramped" edging is used to attractively finish off the CRP carpet. Carpet thickness is ½ inch—the area may be any size without tooling costs or delays. Available in a wide choice of colors and surfacing materials, from deep pile carpeting to tile or battleship linoleum—besides the conventional ribbed rubber.



COLOR-CHANGING CLEANER SHOWS RIGHT USE-DILUTION

(Use Key # 694 on Inquiry Card on page 33)

A REVOLUTIONARY "break-through" in washroom sanitary maintenance has been announced by Associated Just Distributors, Inc. The new product, JUST ColorTel, shows by a clearly seen, automatic change in color when the cleaning and disinfecting solution in the toilet bowl or urinal has reached the proper use-dilution. It requires no measuring devices, and, automatically adjusts itself to the soil and germ load, eliminating over-use.

Red as it comes out of the bottle, the cleaner turns blue as soon as it is diluted in the bowl. Then, as more is added, and the cleaning solution brought to the proper use-dilution, the color changes again, from blue to Safety Green. This is the "go-ahead" sign that the right amount of ColorTel is present to do the job right in that particular bowl, or urinal. If the bowl is extremely dirty, ColorTel shows that more cleaner is needed. If the soil load is light, a lesser amount will be called for. It eliminates measuring, guessing and waste. It also shows when the cleaning solution in the bowl needs "revitalizing" by turning from green back to blue. It cleans, disinfects, deodorizes and reodorizes in one application. It penetrates soil and other deposits quickly, eliminates hard scrubbing, and coats surfaces with a protective shield, too. Packaged in quart-size, safety-grip, no-drip plastic containers for added safety and convenience. Free safety mops with self-sanitizing handles, and inspection mirrors are included in every case.

VISITOR SPEC DISPENSER

(Use Key # 695 on Inquiry Card on page 33)

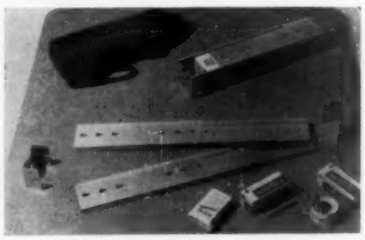
WILLSON Products introduces its exclusive, attractive, free Visitor Spec dispenser in colorful Willson green, white and black. It holds 12 pairs of Willson VS3 Visitor Specs. Equipped to hang on gate house or set on desk or table, dispenser has tear out section at bottom for dispensing individually polyethylene bagged visitor specs one at a time. Pull-out strip on side indicates number of specs remaining in dispenser. Simple to reinsert specs where Visitor specs are reissued. Keeps specs clean and factory fresh. Improved Willson Visitor specs are comfortable, lightweight, economical, have good optical qualities and feature highly impact resistant lenses. They fit over any size prescription glasses.

DUST FILTER CLEANING AND RECONDITIONING SERVICE

(Use Key # 696 on Inquiry Card on page 33)

THE DAY Sales Co. has announced a new service for cleaning, repairing and reconditioning filter tubes and sleeves used in the filter type dust collectors. Tubes of all types, sizes and materials (including felted wools, orlon, nylon and dacron) will be handled. This total service includes: removing tape and stitching; vacuum cleaning; thorough dry cleaning; inspecting the filter sleeves for quality and size; splicing in new material (if required), to return tube to proper size; adding new tape and stitching.

This complete rejuvenating service restores the original porosity of the cloth or felt tubes. Regular cleaning of filter tubes or sleeves keeps back pressures low and air volumes high.



FIRST AID KIT CASE CONVERTS TO SPLINTS

(Use Key # 697 on Inquiry Card on page 33)

THE Redi-Splint First Aid Kit, featuring an aluminum container that converts into a splint set, is the featured innovation of Rock Royal Corp. In an emergency, the kit can be immediately disassembled, first aid supplies deposited in the container bag, and a splint (either regular or traction) constructed in a matter of seconds. The extruded aluminum case is extra strong and light weight. It will never rust, and can be kept clean and sanitary with soap and water. It is available with a full complement of first-aid supplies and is enclosed in a water-repellent canvas container for easy handling and storage. Dealerships open.

ALL-WEATHER EPOXY COATING

(Use Key # 698 on Inquiry Card on page 33)

A NEW protective coating which can be sprayed, rolled or brushed onto any type of surface under all weather conditions has been announced by Bradco Plastics, Inc. Called PlastXcoat, it can be applied to wood, plastic, concrete, brick, glass, aluminum, and even hard-to-paint transites and exotic metals. It is self-priming and is available in 20 colors. Withstanding temperatures ranging from —73 degrees F. to 250 degrees F., it is used for painting, remodeling, and construction in oil refineries, chemical plants, natural gas lines, heavy construction equipment, offices, ships, barges and truck-trailers. Only one coat is needed on most applications. It resists moisture, salt water, corrosive liquids and gases; will not chip, crack, nor peel.

SEMI-ANNUAL INDEX

VOLUME 121 JANUARY–JUNE 1961

EDITORIALS

Silicosis ..... Jan. 4
The Biggest "Fix" ..... Jan. 4
Voice From the Throne ..... Feb. 4
Diamonds Last Forever ..... March 4
Fasten Your Safety Belts ..... April 4
Seven Deadly Sins ..... April 4
Lift That Rug ..... April 4
The Mouths of Babes ..... May 4
The Rug Is Lifted ..... May 4
Growth of Industrial Hygiene ..... June 4
Mine Safety vs Cancer ..... June 4
Nation's No. 1 Safety Man ..... June 4

ACCIDENT PREVENTION

Accident Costs ..... Feb. 9; May 9
Accident Prones ..... April 9
Battery Safety ..... Feb. 15
Blueprint For Eye Safety—J. L. MacKenzie .. May 12
Coffee Urns With Tampered Safety Valves Brew Danger ..... March 19
Do's and Don't's In Using Gas Masks.—S. J. Pearce ..... March 10
Eye Protection ....Jan. 9; March 16; April 12, 14, 22; May 12; June 48
Films Bolster Safety Programs ..... June 17
Fit As a Fiddle for Safety ..... June 6
Guards .....Jan. 25; Feb. 23; April 12; May 17
Head Protection ..... Feb. 21; April 19
"Heads Up" For Overhead Hazards ..... March 14
How to Create & Maintain Safety Interest—George W. O'Neil ..... Feb. 9
How to Use Respiratory Equipment Safely .. Feb. 18
Industrial X-Ray Requires Safety Housing ... April 21
It's a Safety Fact: There's No Time to Duck April 19
Keeping Up With Eye Protection Developments June 48
Keeping Up With Respiratory Protection Developments ..... April 54
Keep Safety In Sight ..... June 9
Ladder Safety Code ..... Feb. 17
Materials Handling ..... June 14
Microwave Radiation Suit ..... Jan. 23
New Electromagnetic Radiation Suit—Risa E. Hirsch ..... Jan. 23
A New Look At the Sight-Glass Problem .... Feb. 27
New York Safety Convention ..... June 21
Non-Slip Compound Tightens Clamp's Grip .. March 17
Nuclear Emergency!—A Case History ..... March 32
Off-the-Job Safety ..... May 9
The Other Safety Features of Safety Eyewear April 14
Phone Keeps Safety Contact In Hazardous Areas ..... June 19
Respiratory Protection Feb. 18; March 10; April 12, 54
Rope Safety ..... June 14
Safe Equipment—Safe Job—Paul J. McDonough ..... June 14
Safety Check List For Batteries—Robert W. Hopewell ..... Feb. 15
Safety Clothing .....April 25; May 24; June 39
Safety Code for Ladders ..... Feb. 17
Safety Equipment For Handling Chlorine .... Feb. 41
Safety Equipment For Handling Formaldehyde Mar. 22
Safety Equipment: Production Stimulator #1 April 12
Safety Points to Emphasize ..... Jan. 15
Safety Problems In Plant Maintenance Richard T. Wise ..... Jan. 16
Safety Programs ..... Jan. 15; Feb. 9
Safety Signs ..... June 10
Safety Suited for Outer Space ..... April 25
Saw Safety In Action ..... May 17
Sight-Glass Safety ..... Feb. 27
Signal & Alarm Systems ..... May 20; June 19
Signals for Crane Operations ..... March 15
Sign Up For Safety ..... June 10
Traffic Mirror For Warehouse Safety ..... May 16
Warning Signals: Which and Where? ..... May 20
We're Missing the Target Off the Job—S. M. Hoffman ..... May 9
Who Will Be Your Injury-Repeater?—Thomas W. Jenkins ..... April 9

MAINTENANCE

Are Cleaning Costs Too High? ..... Jan. 10
Battery Maintenance ..... Feb. 15
Building Maintenance Jan. 10, 16; Feb. 12; March 48; May 15
Cold Weather Maintenance ..... Feb. 25
End Concrete Scaling ..... April 23
Fit As a Fiddle for Safety ..... June 6
Floor Maintenance ..Jan. 10, 52; April 23; May 19
Industry's Watchdog: The Stroboscope—Frederick T. Van Veen ..... Jan. 12
Keeping Up With Floor Maintenance Developments ..... Jan. 52
Keeping Up With Plant Maintenance Developments ..... March 48
Machinery Maintenance ...Jan. 12; Feb. 25; April 21
No-Crack Windows . . . Plus ..... May 15
Rope Maintenance ..... June 14
Safety Problems In Plant Maintenance—Richard T. Wise ..... Jan. 16
Stroboscopes ..... Jan. 12
Tips On Care of Terrazzo Floors—John H. Meischer ..... May 19
Tips On Sanitation Techniques ..... Feb. 12
Washroom Sanitation ..... Feb. 12; April 34

INDUSTRIAL HYGIENE

Air Dust Particles: How Big Are They?—James W. May ..... May 48
Collectors Filter Smoke, Save Heat ..... March 31
A Critical Look At Washrooms ..... April 34
Dermatitis Prevention ..... March 28
Dust & Fume Control Jan. 42; Feb. 46; March 31; April 18, 36; May 48
First Aid ..... Jan. 40; Feb. 43
First Aid Afloat ..... Feb. 43
Health Is In the Air ..... April 35
Help From the Lady In White—Margaret L. Steele ..... June 37
How to Sidetrack Skin Irritations ..... March 28
Industrial Nurses ..... June 37
Industrial Toxicology for the Safety Engineer—Mark M. Luckens ..... June 34
Keeping Up With Dust & Fume Control Developments ..... Feb. 46
Keeping Up With Skin Protection Developments ..... May 52
Nuclear Emergency!—A Case History ..... March 32
Paper Suits Dispose of Nuclear Contamination June 39
Plant Maintenance & Engineering Conference Bears Down On Safety ..... March 9
A Review of Dust Collection Equipment—David G. Stephan ..... Jan. 42
Skin Protection ..... March 28; April 34; May 52
Some Tips On Bandaging Techniques ..... Jan. 40
Toxicology ..... June 34

FIRE PROTECTON

All-Purpose Fire Extinguishers ..... March 41
Deluge Protects Airline Passengers ..... Feb. 31
Do-It-Yourself Fire Fighting School ..... Jan. 35
Extinguishers ..... March 41
Extinguishing Agents ..Jan. 29; March 41; April 48; June 42
Extinguishing Systems ..... Feb. 31, 33
Fire Communication Counts ..... April 51
Fire Detection Systems ..... May 33; June 45
Fire Protection For Coal Loaders ..... Feb. 30
Fire Training ..... Jan. 35; May 30
Heat Ratings of Building Materials ..... Jan. 30
How Effective Are Dry Powders on Liquid Fire? June 42
Incinerator Fire Jet System ..... Feb. 33
On the Fire Horizon ..... April 48
No Close Shaves—With Explosions ..... May 33
Security Guard Or Clock Watcher? ..... March 43
Stock Exchange Detectors Give "Hot Tips" June 45
They Know the Knack of Fire Fighting ..... May 30
Watchmen's Systems ..... March 43

SPECIAL DEPARTMENTS

Achievements & Awards Jan. 22; Feb. 36; March 46; April 42; May 38; June 57
Another Injury Checked Jan. 20; Feb. 21; March 16; April 22; May 24; June 22
Inside the Trade Jan. 49; Feb. 59; March 58; April 59; May 58; June 59
Learning the Hard Way ..... Feb. 35; May 56
Loss Stoppers Jan. 1; Feb. 1; March 1; April 1; May 1; June 1
Safety On Film ..... Feb. 57; March 57; May 43
"Safety Maintenance" Salutes Jan. 25; Feb. 23; March 20; April 18; May 16; June 24
The Safety Shelf Jan. 36; Feb. 58; March 36; April 29; May 41
What's the Law? Jan. 26; Feb. 55; March 24; April 27; May 25; June 30
What's New? Jan. 60; Feb. 61; March 60; April 61; May 60; June 61

NEW PRODUCTS & RECENT DEVELOPMENTS

Air Conditioner Line ..... Feb. 52
Air Ducting, Mine ..... Feb. 47
Air Gun, Safety Type ..... June 61
Air Sampler, Automatic ..... March 63
Air Sampler, Continuous ..... Feb. 46
Air Sampler, Dust ..... Feb. 51
Alarm, Burglar-Intruder ..... Jan. 62
Alarm Control Console ..... March 65
Alarm Horn, Pressurized Gas ..... April 62
Alarm, Vehicle Back-Up ..... March 64
Analyzer, Particle ..... Feb. 52
Antiseptic Swab Aids ..... May 61
Asphalt Patcher ..... Feb. 62

Barricade, Reflectorized ..... Jan. 64
Barricade with Safety Handles ..... May 63
Boot, Air Conditioned ..... April 61
Bo's'n's Swing ..... Feb. 62
Breathing Apparatus, ½ Hour ..... April 56
Burn Relief Spray ..... Feb. 65
Can, Drain, Flammable Liquids ..... Jan. 63
Cap, Bump, Lightweight ..... Feb. 61
Cement Additive Stops Leaks ..... May 65
Cement That Pours ..... March 48
Chlorine-In-Air Detector ..... Feb. 46
Cleaner, All-Purpose, Antiseptic ..... May 62
Cleaner, Aluminum ..... March 52
Cleaner, Hard Surface ..... May 65
Cleaner, Maintenance ..... March 51
Cleaner, Scale ..... March 54
Cleaner, Shower Stall ..... March 49
Cleaner-Solvent, Truck ..... March 53
Cleaner, Steam, Remote Control ..... March 48
Cleaner, Toilet Bowls ..... April 64
Clothing, Disposable ..... June 65
Clothing, Lint & Static Free ..... Feb. 63
Clothing, Rocket Fuel Handler's ..... June 64
Coating Aluminum Siding ..... Jan. 60
Coating, Fiberglass Flake Spray ..... March 53
Coating Resists Jet Fuels ..... June 64
Coating, Vinyl Spray ..... March 51
Concrete Hardener ..... Jan. 58
Deodorizer, Temporary Toilets ..... April 63
Dispenser, Hand Cleaner ..... April 65; May 54
Dispenser (Soap) & Shelf ..... May 53
Dispenser, Soap, Foot Operated ..... May 54
Dispenser, Waterless Cleaner Can ..... May 53
Drain Cleaner, Liquid ..... March 50
Drum Warmer-Cooler ..... March 61
Dust Boot, Hand Valves ..... Feb. 61
Dust Collector, Cement Dust ..... Feb. 52
Dust Collector, Flooded Disc ..... Feb. 48
Dust Collector, High Temperatur ..... May 65
Dust Collector, Improved ..... Feb. 53
Dust Collector Line ..... Feb. 49
Dust Collector, Portable ..... Feb. 53
Dust Vacuum, Radioactive ..... Feb. 51
Ear Plug, Plastic ..... Jan. 62
Electrical Tape, Sub-Zero ..... Jan. 63
Emergency Light, Automatic ..... April 64
Emergency Light, Dry Battery ..... May 61
Emergency Lighting ..... Feb. 64
Exit Light & Alarm ..... Jan. 61
Explosion-Proof Outlet & Plug ..... April 63
Explosion-Proof Plugs ..... March 61
Extinguisher, Aircraft ..... Jan. 64
Extinguisher, All Use ..... May 62
Extinguisher Bracket, Dry Chemical ..... Jan. 61
Extinguisher, Foam ..... March 62
Extinguisher, High Rating CO_2 ..... April 63
Eyewash Fountain & Drench Shower ..... June 62
Face Shield, Chin Protecting ..... May 62; June 52
Face Shield, Heat Resistant ..... June 54
Face Shield, Lightweight ..... June 53
Face Shield Line ..... June 49
Face Shields, New ..... Feb. 64; June 53
Fan, Axial Flow ..... Feb. 52
Fan, Duct, Removable ..... Feb. 48
Fan, Dust & Fume Control ..... Feb. 53
Fan Line, Tubeaxial ..... Feb. 46
Fan, Penthouse ..... Feb. 46
Film Badge Service, Improved ..... April 62
Filter, Air, High Efficiency ..... May 64
Filter, Air, Industrial ..... Feb. 50
Filter, Air, Trim-to-Size ..... Feb. 46
Filter, Dust, Improved ..... Feb. 48
Filter, Green, Dust Counting ..... April 64
Fire Alarm System, Non-Electric ..... May 63
Fire Detector, Infrared ..... June 62
Fire Detector, Quick Response ..... April 62
First Aid Kit for Burns ..... June 61
First Aid Kit, Motor Vehicle ..... March 61
First Aid Kits, New Line ..... June 64
Floor Cleaner, All-Purpose ..... Jan. 56
Floor Cleaner, Controlled Foam ..... Feb. 65
Floor Cleaner Liquid ..... Jan. 56
Floor Coating, Non-Slip ..... April 65
Floor Finish, Acrylic ..... Jan. 58; March 49
Floor Finish, Epoxy, Anti-Slip ..... March 64
Floor Finish, Non-Slip ..... Jan. 57
Floor Finish, Plastic ..... June 64
Floor Finish, Polymer ..... May 61
Floor Finish, Scuff Resistant ..... Jan. 54
Floor Machine, High Speed ..... Jan. 58
Floor Machines, Light Duty ..... Jan. 56
Floor Machine, LP Gas ..... Feb. 63
Floor Machines, Rental Line ..... Jan. 53
Floor Machine Pads ..... Jan. 54
Floor Machine Shampoo Brush ..... Jan. 52
Floor Machine, Sweeping ..... Jan. 57
Floor Machine with Silencer ..... April 65
Floor Machine Tank Gauge ..... May 61
Floor Maintenance Compounds ..... June 62
Floor Mat, Non-Slip ..... June 62
Floor Overlay Material ..... May 62
Floor Paint, Latex ..... Jan. 57
Floor Patching Compound ..... Jan. 54
Floor Polish, Slip Resistant ..... Jan. 52
Floor Repair Compound ..... Jan. 56
Floor Repair Material, Plastic ..... Jan. 58
Floor Resurfacer, Chemical Resistant ..... May 60

Floor Resurfacer, Epoxy ..... March 62
Floor Scrubber-Vacuum ..... Jan. 56
Floor Sealers ..... Jan. 56
Floor Sealers, Urethane ..... March 50
Floor Slab Overlay ..... Jan. 55
Floor Squeegee Attachment ..... June 64
Floor Surfacing, Luminous Non-Slip ..... Jan. 53
Floor Sweeper, Battery Type ..... June 65
Floor Sweeper, Hydraulic Power ..... Jan. 55
Floor Sweeper, Magnetic ..... June 61
Floor Sweeper, Rider Type ..... Jan. 53
Floor Sweeper with Dust Vacuum ..... Jan. 58
Floor Vacuum Cleaners ..... Jan. 58
Floor Vacuum, 3-Way Portable ..... Jan. 54
Floor Wax Applicator ..... Jan. 54
Fountain, Eyewash, Emergency ..... March 62
Fume Control, Arc Furnace ..... Feb. 52
Fume Disposal, Automatic ..... Feb. 51
Fume Exhauster, Flexible ..... Feb. 50
Fume Exhaust Eystem ..... Feb. 47
Fume Removal System ..... Feb. 50
Fungicide Solution Container ..... May 54
Fuse Adapter Remover ..... June 64
Fuse, Dual Element ..... March 63
Gas Detector, Explosive ..... Feb. 64
Gas Detector, Toxic ..... Feb. 50
Gas Leak Detector ..... March 50
Gas Mask & Breathing Apparatus ..... April 56
Gas Mask, Emergency Escape ..... April 54
Gas Mask for Firemen ..... April 54
Gas Mask Headgear Seal ..... April 56
Gas Mask & Rescue Lung ..... May 64
Gas Mask, Rocket Fuel ..... March 65; April 55
Gas Mask Speaker Unit ..... Jan. 64; April 55
Gas Mask Voice Unit ..... June 61
Gas & Vapor Indicator ..... Jan. 63
Gauge, Water Level ..... Feb. 65
Glove, Easy Slip-On ..... March 60
Glove Dispenser, Plastic Glove ..... Jan. 62
Glove, Plastic Coated ..... Feb. 63
Glove, Plastic Coated, Reversible ..... April 65
Glove, Sheer, Extra Large ..... Jan. 64
Glove Tester, Portable ..... April 61
Glove, Welders, Buckskin ..... June 61
Glove, White Rubber ..... March 63
Goggles, Chemical-Chipping-Welding ..... Jan. 60; June 54
Goggles, Eyeshield Design ..... March 65; June 50
Goggles, Flexible Mask ..... March 60; June 49
Goggles, Flexible Plastic ..... June 52
Goggles, Flexible, Ventilated ..... June 51
Goggles, Lightweight Spectacles ..... June 54
Goggles, Nylon Spectacles ..... June 49
Goggles, Plastic Frame Spectacle ..... June 51
Goggles, Safety, Agricultural ..... June 53
Goggles, Safety Fashioned Spectacles ..... June 48
Goggles, Safety Spectacle Frames ..... June 52
Goggles, Safety Spectacle Line ..... Feb. 63; June 52
Goggles, Safety Spectacles ..... Feb. 65; June 52
Goggle Side Shields ..... June 50
Goggle Side Shields Fold Flat ..... May 60; June 50
Goggles, Spectacle Type ..... June 55
Goggles, Visitor's, Imprinted ..... June 49
Goggles, Visitor's Spectacles ..... June 55
Goggles, Welding ..... Jan. 64; June 50
Goggles, Welding, Ventilated ..... June 51
Goggles with Safety Cap ..... June 48
Goggles, Women's Spectacles ..... April 63
Ground Detector ..... March 61
Guard, Photoelectric ..... April 62
Hammer, Electric ..... March 64
Hard Cap, Recreation Type ..... June 63
Hat Suspension ..... May 65
Hearing Aid, Transistorized ..... Feb. 64
Heater, Infrared ..... April 64
Heat Resistant Fiber ..... June 63
Hydrogen Sulfide Eliminator ..... Feb. 48
Ice & Snow Melter ..... Jan. 63
Incinerator, Wheeled ..... June 62
Insulation, Pipe, Wrap-On ..... March 52
Isolation Cabinet, Lab ..... March 63
Ladder, Platform ..... May 64
Ladder Rung Gripper ..... Jan. 63
Ladder Shoes, Anti-Skid ..... March 50
Ladder Shoes, Stepladders ..... May 64
Ladder Tester ..... Jan. 61
Ladder, Two-Wheeled ..... March 55
Lanyard, Adjustable ..... May 62
Lawn Sweeper ..... March 54
Lens Care Station ..... April 63
Lens Cleaner Bottle, Plastic ..... March 64; June 49
Lens Cleaner Cabinet ..... June 51
Lens Cleaner Container, Plastic ..... Feb. 64; June 55
Lens Cleaning Tissues ..... Feb. 65
Lifeline Shock Absorber ..... April 64
Light, Emergency Highway ..... Jan. 64
Light Fixture & Air Diffuser ..... March 62
Light, Flasher, Impact Resistant ..... April 64
Light, Hand, Approved ..... March 60
Light & Heat Fixture, Infrared ..... Jan. 61
Light Mounting, High ..... Jan. 61
Light Switch, Photoelectric ..... May 61
Lineman's Safety Blanket ..... March 64
Line Painter ..... March 55
Magnet, Multipie Use ..... June 63
Mat, Sterilizing, Hospital ..... April 65
Mop, Dry, Static Charge ..... March 48
Mop Bucket, Graduated ..... Jan. 54
Mop Bucket, Measured ..... Jan. 52
Mop Fire Retardant Compound ..... June 63
Mop & Tank Equipment ..... Jan. 53
Mop Treatment, Bactericidal ..... Jan. 57
Mop Truck, Maintenance ..... Jan. 58
Nitrogen Dioxide Detector ..... Feb. 48
Noise & Vibration Meter ..... March 64
Non-Sparking Pliers ..... Feb. 64
Paint, Metal Protecting ..... March 54
Paint, Rust Inhibitive ..... Jan. 63
Paint, Rust Preventive ..... March 49
Paint, Rust Resistant ..... March 53
Paint Spray, Fluorescent ..... March 62
Patcher, Chuck Hole ..... April 64
Photoelectric Control ..... March 61
Platform, Hydraulic Telescoping ..... March 55
Platform, Work, Hydraulic ..... Jan. 63
Poison Ivy Immunizer ..... May 53
Radiation Survey Meter ..... Jan. 60
Radio, Two-Way, Mobile ..... Feb. 62
Radio, Walkie-Talkie ..... April 62
Remover, Rust Alkaline ..... March 65
Repair Sealer, Metallic ..... March 53
Repair Material, Plastic Steel ..... March 52
Respirator, Dust ..... March 63; April 54
Respirator, Paint, Approved ..... Feb. 61; April 55
Respirator, Paint & Nuisance Dust ..... April 56
Respirator, Paint Spray & Dusts ..... April 57
Respirator, Radioactive Dusts ..... May 64
Rubber, Shoe Covering ..... Jan. 63
Resuscitation Kit ..... May 64
Resuscitator, M to M Device ..... Jan. 62
Resuscitator, Oral Type ..... June 65
Roof Patcher ..... March 54
Roof Weatherproofing ..... March 52
Roofing Spray ..... March 54
Safety Hook, Load Releasing ..... June 63
Safety Hook, Sling Chain ..... March 63
Safety Lens Demonstrator ..... June 48
Scaffold Unit ..... March 61
Scales, Remote Indicating ..... June 65
Sealer, Caulking, Rubberized ..... April 63
Sealer, Masonry Leak ..... April 61
Sealer, Water Repellent ..... March 53
Shower, Emergency Drench ..... Jan. 61
Shower Valve, Metered ..... Jan. 64
Sign, Fluorescent Changeable Letter ..... April 61
Skin Cleanser, Foam ..... May 53
Skin Cleanser, Powdered ..... May 52
Skin Cleanser, Waterless ..... May 54
Skin Cream, Aerosol ..... May 54
Skin Cream, Cutting Oil ..... June 64
Skin Cream, Epoxy & Glass Wool ..... May 52
Skin Cream, Medicated ..... May 54
Skin Cream, Therapeutic ..... May 54
Skin Lotion, Portective Barrier ..... May 52
Sling Chain with Warning Ring ..... April 62
Slippers, Disposable Paper ..... May 60
Smoker Disposal Units ..... March 60
Snake Bite Kit Extension Tube ..... May 63
Snow Plow, Industrial ..... March 49
Soles, Ripple, Lightweight ..... June 62
Solvent, Improved ..... April 65
Solvent, Less Toxic ..... April 62
Sound Meter Calibrator ..... June 65
Staging, Self-Propelled ..... Feb. 62
Stair Tile, Non-Slip ..... March 49
Static Neutralizer ..... May 64
Stirrer, Magnetic ..... Feb. 62
Stretcher Reduces Vibration ..... May 63
Television Monitor, Industrial ..... May 63
Tester, Non-Destructive, X-Ray ..... March 64
Test Gauge, Breathing Apparatus ..... April 55
Test Stand, Valves ..... March 50
Toilet Seat, Automated ..... May 62
Tool, T-Slot Cleaner ..... March 52
Topical Anesthetic Spray ..... April 65
Torque Limiter ..... Jan. 60
Tote Bin for Flammables ..... Jan. 62
Traffic Marker, Plastic ..... Jan. 62
Truck Bumper, Pressure Sensitive ..... May 65
Truck & Drain Rack, Drum ..... Feb. 62
Truck, Hand, High Access ..... March 65
Truck & Lift, Machine ..... Feb. 65
Ultrasonic Cleaner, Compact ..... April 61
Ultrasonic Cleaning Solvents ..... May 62
Ultrasonic Micrometer ..... March 62
Vacuum Cleaning Tools ..... March 50
Vacuum Hose & Tool Cabinet ..... June 63
Valve Locator, Transistorized ..... March 54
Ventilation Blower ..... Jan. 62
Ventilator, Glass Fiber ..... Feb. 47
Ventilator, Portable ..... Feb. 50
Ventilator, Tubeaxial, Portable ..... Feb. 53
Vents, Tank, Horizontal Discharge ..... May 65
Vest, Highly Visible ..... May 60
Vibration Meter ..... Feb. 63
Washcloth, Antiseptic Paper ..... March 62
Waste Can Bags ..... Feb. 63
Waste Can, Deodorizing Spray ..... Feb. 63
Water Cans, Insulated ..... Feb. 65
Weed Killer ..... May 61
Weight Indicator, Remote Reading ..... Feb. 64
Welding Cable Protector ..... June 62
Welding Equipment, AC-DC ..... March 64
Welding Face Shield ..... June 53
Welding Helmet, Jaw-Actuated Lens ..... June 54
Welding Helmet, Neoprene Lens Holder ..... Feb. 61; June 50
Welding Helmet, Universal Fit ..... June 49
Welding Helmet, Wide Vision ..... June 54
Welding Screen with Hangers ..... May 61
Wheel Block Carrier ..... Feb. 65
Wipers, Lint Free ..... May 60
Wire Rope, New Type ..... March 60

Index to Advertisers and their Agencies

American Optical Co. ..... 4 ..... *Fuller & Smith & Ross, Inc., New York*

Bausch & Lomb, Inc. ..... Inside Front Cover ..... *Wolff Associates, Inc., Rochester*
Bullard Co., E. D. ..... 53 *Erwin, Wasey, Ruthrauff & Ryan, Inc., San Francisco*

Carbisulphoil Co. ..... 39 ..... *Tracy-Locke Co., Inc., Dallas*

Du Pont & Co., Inc. ..... 1 *Batten, Barton, Durstine & Osborne, Inc., New York*

Gagnon Enterprises 17

Haws Drinking Faucet Co. ..... 37 ..... *Pacific Advertising Staff, Oakland*
Hynson, Westcott & Dunning ..... Back Cover

International Film Bureau, Inc. 59

Junkin Safety Appliance Co. ..... 55 ..... *Farson, Huff & Northlich, Louisville*

Meyer Machine, Inc. ..... 61 ..... *Wm. L. Baxter Advertising, Minneapolis*

Osborn Manufacturing Corp. ..... 39 ..... *Tri-State Advertising Co., Inc., Warsaw*

Wilkins Co., Inc. ..... 25 ..... *Laux Advertising, Inc., Ithaca*

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1. Siver, R.H.: Current Medical Digest, Vol. XXI, September 1954.

2. Weekes, D.J.: New York State Journal of Medicine, Vol. 58, August 1958.

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